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# Carolina Planning

Vol. 15, No. 2, Fall 1989

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# Carolina Planning

**A Student-Run Publication of the University of North Carolina Department of City and Regional Planning**

**Volume 15**
**Number 2**
**Fall 1989**

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*This issue has been printed on recycled paper.*

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# Editor's Note

Human actions--not only in the United States, but around the globe--are steadily degrading the quality of the environment. Relentless urbanization, the proliferation of hazardous waste, and the fall out from "disposable" societies pose increasing threats to the environment worldwide.

In order to address these issues most effectively, planners must expand upon their role as champions of the environment. Planners can start by fostering a change in the public's attitude toward the environment and the conservation of natural resources. In this regard, a number of strategies hold promise. These strategies include: educating the public about recycling efforts; encouraging the reuse and redevelopment of existing urban areas through the land use planning process; and making the public aware of conservation programs that they can get involved in.

Everyone has a great deal at stake in the impending global environmental crisis. Each citizen, therefore, should be aware of the environmental consequences of daily human activities, and measures that can be taken to mitigate the adverse effects.

*Irving Boykins*

**Carolina Planning** welcomes comments and suggestions on the articles published. Our upcoming Spring 1990 publication will include a section on *Politics and Planning*. We are currently accepting articles for our Fall 1990 issue. For more information about submissions, address correspondence to: **Carolina Planning**, The University of North Carolina at Chapel Hill, Campus Box # 3140, New East Building, Chapel Hill, North Carolina 27599-3140.

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## In The Works

# Integrated Waste Management: The Mecklenburg County Experience

**Elizabeth W. Dorn**

*In response to rising costs, legal barriers, environmental concerns, and public opposition to landfilling, Mecklenburg County has established an integrated solid waste management program. No comparable program exists in the southeastern United States, and few exist in the country. This article describes the Mecklenburg County program and the events leading up to its creation.*

Cary Saul, former Deputy Director of Engineering and head of Mecklenburg County's solid waste group, describes integrated waste management as "handling solid waste in the best way possible using all available options and taking into account the environment, cost, and what seems most practical." The county's solid waste management program is founded on the philosophy that the generation of waste should be prevented or reduced whenever possible, and that materials in the waste stream should be:

- Reused if their generation cannot be prevented
- Recycled if they cannot be reused
- Processed for resource or energy recovery if they cannot be directly recycled
- Buried in a sanitary landfill only as a last resort

County staff, with the assistance of several consultants, developed estimates on how much waste could be managed by each method. These estimates were then adopted as the county's planning objectives. They are: recycle fifteen percent of the waste stream by 1994 and thirty percent by 2006; convert forty percent of the waste into energy for sale to businesses and institutions by 2006; and reduce the amount of waste landfilled from ninety-nine percent of the total to thirty percent.

Teamwork among county staff, elected officials, and citizen advisory boards was and will continue to be essential to the development and attainment of the county's solid waste management objectives. In 1977, a group of environmentally concerned citizens approached Mecklenburg County officials to request that recycling centers be established at selected area high schools. The county established five such centers and created the Mecklenburg Citizens Committee for Recycling to work with staff in developing additional recycling programs. The fact that information was shared openly with this committee enabled citizen input to shape significantly the county's recycling plans.

The county formed a Solid Waste Management Advisory Board in 1983 to provide a vehicle for citizen input in all waste management areas. This board worked directly with staff to draft the Mecklenburg County solid waste management plan. The plan was submitted to each municipality for approval. Public meetings on the plan were held to obtain more citizen input. The city of Charlotte has approved the plan, and county officials are in the process of negotiating the plan details with the remaining six Mecklenburg towns.

A truly integrated waste management program must remain flexible to allow for changing conditions, such as technological advancements and fluctuating recyclables markets. Mecklenburg County's waste management plan provides for "continual evaluation of programs and facilities and reassessment of existing and projected needs." The Solid Waste Management Advisory Board is charged with annually reviewing the plan and providing recommendations to county officials on how it should be revised.

Recently, county staff and Solid Waste Management Board members recognized the need for more municipal involvement in the review process, particularly by the city of Charlotte, which generates approximately one-third of the county's waste. The structure of the Solid Waste Manage-

ment Board was modified to include five city council appointees. Moreover, a joint city-county staff technical advisory committee was established to assist with implementation of the waste management plan. This step was particularly critical with regard to recycling, because in Mecklenburg County, municipalities are responsible for solid waste collection, while the county is responsible for waste disposal. Recycling does not clearly fall under either category.

According to county staff, two of the county's biggest planning errors were the failure to involve all affected parties early in the planning process, and the failure to ensure integration in the transportation of solid waste in addition to providing integrated waste management facilities. Formation of the joint technical advisory committee helped to address needs in both of these areas. In addition, meetings with the major waste haulers have been held and on-going communication is now maintained.

**Table 1. Curbside Recycling - Phase I Results**

| | |
|---|---|
| 16,000 | Households now on line |
| 71% | Of households set out recyclables at least once a month |
| 8.75% | Of residential wastes could be recovered if service was expanded county-wide |
| | |
| Of participating households: | |
| 92% | Set out newspapers |
| 63% | Set out glass |
| 52% | Set out PET (plastic containers) |
| 48% | Set out cans |
| | |
| 3 | Collection vehicles |
| 1-2 | Full loads collected per day |
| 1,200 | Homes per route |
| | |
| Materials Recovery Rates (Pounds per Household Served per Year) | |
| Newspaper | 260.78 |
| Glass | 46.60 |
| Cans | 3.05 |
| PET | 4.38 |

Critical to an integrated waste management program is the full commitment of elected officials, staff, and the public as exhibited by follow-through in the funding process. Funding mechanisms must be developed and public understanding and support concerning the costs must be obtained in order for program plans to become a reality.

In Mecklenburg County, the county manager's office and the Board of Commissioners have consistently ranked all major solid waste projects as high-priority items. The county's fiscal year 1988-89 solid waste budget is over $3.5 million. The combined capital and operating budget for the recycling program alone totals over $1 million. Landfill tipping fees, now at $18.50 per ton are set to cover operating expenses. The public overwhelmingly approved two separate bond referenda for solid waste management facilities totaling over $98 million. Over $5 million are earmarked for recycling facilities, and $29 million for the 200-ton-per-day incinerator scheduled for start-up in June. Seventeen million dollars are for construction of a 575-acre lined landfill facility and $47 million for future resource recovery projects.

One major advantage that Mecklenburg County has had thus far in implementing the waste management program is the low level of public opposition to waste-to-energy facilities. This high level of community support is largely attributable to the county's provision of approximately half a million dollars over the past five years to fund an extensive solid waste communications program. The purpose of the program is to develop public awareness and understanding of solid waste management issues; to develop support for the county's waste management plan; and to promote participation in recycling. The program also helped maintain the support of elected officials, since they, too, were exposed to the communication materials.

**Table 2. Curbside Recycling - Phase I Costs**

| | |
|---|---|
| Cost Projections for Service to 94,000 Households: | |
| Annual collection costs: $932,961 | |
| Processing Costs if County Owned and Operated (Includes Capital and Operating): | |
| Year 1: | $1,034,379 |
| Year 2: | $878,979 |
| Projected Sales Revenue: | $758,710 |
| | |
| Annual Net Costs (Excluding Avoided Collection and Disposal Costs) | |
| Year 1: | $1,321,133 ($14.05/household/year) |
| Year 2: | $1,165,733 ($12.40/household/year) |

The public's support for the program was enhanced by their confidence that the county was really committed to making things work. County commitment was evidenced in part by a major reorganization of the engineering department. To keep these three divisions operating in an "integrated" fashion, joint supervisory staff meetings are held every two weeks, joint meetings of field personnel are held once a month, and social events such as fish fries are held periodically throughout the year.

In summary, Mecklenburg County staff and officials have

developed an understanding that establishment of an integrated planning and management process provides for the most successful integrated waste management program. The following sections describe the county's solid waste management program components.

## Landfilling

Currently, about ninety-nine percent of Mecklenburg County's solid waste is buried in unlined sanitary landfills. The state of North Carolina now requires "engineering devices" such as liners and leachate collection systems in all future landfills. The lack of clear guidelines for these requirements makes design work difficult and expensive.

*Collection trucks for the Curbside Recycling Program have compartments to keep recyclables separated.*

The county's Solid Waste Management Plan states that when the resource recovery and recycling programs are fully implemented, landfills will be used only to dispose of non-combustible and non-recyclable materials. Ash from waste-to-energy facilities also will be buried in landfills unless ash recycling options become available. Still, nine hundred to twelve hundred acres will be needed for landfills over the next twenty years.

## Resource Recovery

An incinerator that will burn trash to produce electricity (termed *resource recovery*) is now under construction. A second facility is under study for operation in 1993.

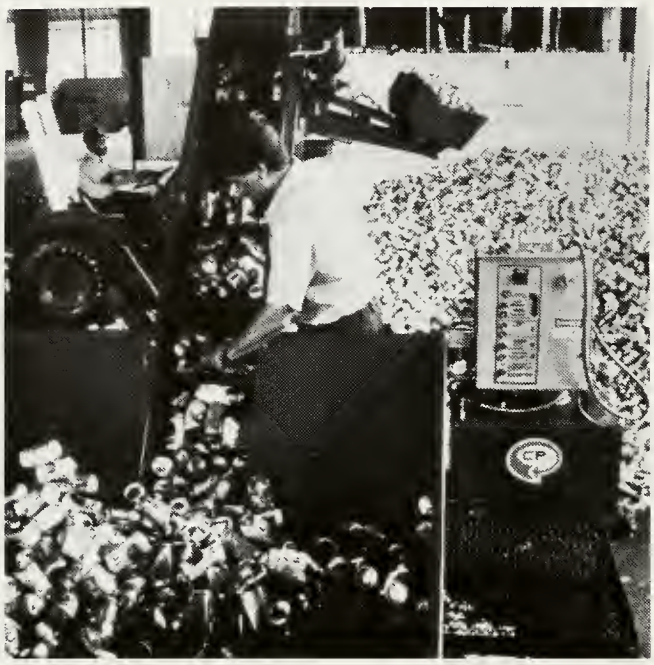
## Recycling

Mecklenburg County's recycling operations are integrally linked with its landfill and resource recovery operations. Tipping fees at the disposal facilities are set to cover recycling program expenses. Incentives are built into the fee structure to encourage recycling behavior; for example, private citizens handling household trash are exempt from paying the fee if they bring in a sufficient amount of recyclables separated from their trash. Recycling centers at all disposal sites will be incorporated in the design of future facilities. Incineration will be used to dispose of some waste, while recyclables will be removed from the waste stream by residents (termed *source separation*) prior to burning through curbside recycling programs.

Commercial and industrial waste recycling programs are also being initiated for as many materials as possible. City and county officials are considering making source separation mandatory and banning the disposal of high value materials like cardboard and aluminum cans. These measures will take effect if voluntary participation proves insufficient to meet the thirty percent recycling goal. Such measures place responsibility on waste generators to find outlets for recyclable materials which the county considers to be valuable products that do not belong in the waste stream.

Mecklenburg County's current recycling program includes a variety of interrelated services and facilities. Seven unstaffed drop-off centers collect newspapers, aluminum and bimetal beverage cans, plastic soft drink and liquor bottles and, at selected centers, glass and corrugated cardboard. A staffed center for disposal of household waste and recyclables serves rural north Mecklenburg residents. Instead of paying a waste disposal fee, users of this center must bring in a designated amount of recyclables in order to dump their garbage. The county plans to add several more centers for use by rural residents and multi-family dwellers who will not receive curbside recycling service.

At the county landfill, a staffed drop-off center accepts newspapers, glass, aluminum cans, plastic bottles, cardboard, scrap metals, used motor oil, and lead acid batteries. Recyclables can be donated in lieu of paying the landfill



*Bottles and cans, glass and plastic, and steel and aluminum are separated by workers at a central processing center.*

tipping fee.

Additionally, the county has established a cooperative arrangement with the city of Charlotte, Goodwill Industries, and the Salvation Army to segregate scrap metal obtained through bulky item collections. This metal, along with that brought to the landfill from other sources, is separated by grade to maximize sales revenues.

To increase recovery of corrugated cardboard, vehicles containing a large proportion of corrugated boxes are directed to dump at a designated site on the edge of the active area of the landfill. Two laborers separate the cardboard, throw it into a rear packer truck, and haul it to a local waste paper dealer. This program is a pilot for a larger recovery operation to be conducted at the county's Materials Recovery Facility (MRF) scheduled for operation this winter. The MRF will accept loads containing over seventy percent corrugated boxes in return for a reduced dumping fee and a disposal site more convenient than the landfill. The material will be fed onto a sorting conveyor where contaminants will be removed and the clean cardboard baled. The MRF will also house processing equipment for materials recovered through the county's curbside collection program and drop-off centers.

County staff estimate that approximately one-fourth to one-third of all residential waste is yard waste--leaves, brush, and grass clippings--making this material the single largest component in the waste stream and the most important to recover and recycle. In August 1987, the county hired consultants to design a separate collection, processing, and marketing system for yard wastes and selected other vegetative products. Once implemented, this project will involve the separate collection of yard wastes by Charlotte and other municipalities in the county, with processing performed by Mecklenburg County. Plans are to operate one small composting site to serve the three north Mecklenburg towns and a twenty-two acre site to serve Charlotte and the remaining municipalities. Both facilities are expected to be operational by 1991.

The county currently owns a tub grinder, also at the grinder, which shreds waste brush and tree limbs brought in by landscapers and others. The shredded product, called "metro mulch", is sold to the public and is used by city and county departments to landscape public facilities. A magnetic separator enables the production of mulch from the shredding of wooden shipping pallets by removing nails and other metal fasteners.

In addition to these programs, Mecklenburg County collects white office paper and computer printout from all major county buildings. This service, named "Paper Chase," has recently been extended to the new city-county government center, which houses one thousand employees. Plans are for this building to serve as a model for instituting office paper recovery throughout the central business district. The county will provide promotional materials, technical and marketing assistance, and staff help to participating businesses during start-up.

**Table 3. Statistics for Mecklenburg County**

| | |
|---|---|
| County Population: | 470,000 |
| Charlotte Population: | 385,000 |
| Population Range | |
| Of Six Remaining Municipalities: | 1,378-12,600 |
| Population of Unincorporated Area: | 51,454 |
| | |
| Population per Square Mile: | |
| Inside Charlotte: | 2,315 |
| Outside Charlotte: | 229 |
| | |
| Tons of Solid Waste Generated Per Day | |
| County Total: | 1,800 |
| From Charlotte: | 85% |
| From Six Other Municipalities: | 5-10% |

In February 1987, Mecklenburg County launched the first phase of a weekly curbside collection program for newspapers, glass containers, aluminum and bimetal beverage cans, and plastic drink bottles. Service recipients receive a red plastic container for storage and placement of their recyclables at the curb. The recyclables are sorted into three compartments in specialized collection trucks. The

*Newspapers, yard waste, and bottles and cans are some of the materials now separated from the waste stream by consumers at home, thus reducing Mecklenburg County's landfill needs. Special recycling containers are provided by the city.*

material is further sorted and prepared for sale at a twelve thousand square foot processing center.

Currently, sixteen thousand households receive this service. County-wide expansion of the program is dependent on the future opening of the Materials Recovery Facility. At that point Charlotte will expand curbside recycling service to include ninety-four thousand households.

## Evaluation

During Phase I of the curbside service implementation, an extensive evaluation was performed. The results are being used to fine-tune the design of the county-wide collection, processing, and marketing system. The evaluation report is available from the Mecklenburg County Engineering Department for a nominal fee. Selected county statistics and evaluation results are provided in the accompanying tables.

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Formerly manager of Mecklenburg County's Recycling Division, **Elizabeth (Betsy) Dorn** is manager of Solid Waste Recycling for Hazen and Sawyer, an engineering consulting firm specializing in water resources, wastewater, and solid waste management projects. Ms. Dorn works in Hazen and Sawyer's Raleigh Regional office and is an alumnus of the UNC-Chapel Hill Department of Environmental Sciences and Engineering.

# A Regional Solid Waste Task Force: Making It Work

**Blair L. Pollock**

*North Carolina faces a growing shortage of landfill space. To address this problem, Orange and Durham Counties have recently joined together to create a regional solid waste task force. This article describes the genesis, structure, and function of this multi-jurisdictional body.*

## Introduction

As the present group of sanitary landfills reaches capacity, solid waste management has become both more expensive and technically and politically more complex. Over half of North Carolina's landfills will be full within the next five years. New state regulations require that existing landfills, now simple holes in the ground, be replaced with lined landfills costing $150,000 per acre, incinerators costing over $100,000 per ton of daily capacity, and recycling programs costing over $50 per ton. Other potential waste management methods are also expensive. In addition, the lead time needed to construct any type of waste management facility is increasing, and the regulations remain in a constant state of flux.

In recognition of these challenges, the mayors of Durham and Chapel Hill in 1986 founded the Regional Solid Waste Task Force (RSWTF) as a mechanism for local governments in the Triangle area to examine the potential for regional solutions to solid waste management. Although other Triangle governments and Alamance County attended initial meetings, by November 1986, the RSWTF consisted of only the local governments in Durham and Orange Counties, both of whose landfills are scheduled to reach capacity by early 1997. These five local governments--the towns of Carrboro and Chapel Hill, the city of Durham, Durham County and Orange County--initiated a process to systematically determine the potential for regional solutions to the problems.

The possibility for regional cooperation hinged on the timing of projected landfill closures and a desire by the involved governments to reduce the costs of the next generation of solid waste management facilities. In 1986, when this process was formalized, a planning horizon of four years was chosen to study the options available, select an approach, and design a plan to implement it. This would leave five years for implementation, so that the required organization and the technologies for recycling, volume reduction, and safe disposal of the residues would be in place by 1997, when the landfills are due to close.

## Why a Regional Approach?

Generally, solid waste disposal is conducted by one government within a county for the other governments. There is often an adversarial relationship between the waste generators (e.g., municipalities which collect solid waste), and the disposer (e.g., a county which operates a landfill). Typically, as the landfill grows, tipping fees increase, as do restrictions on what can be landfilled. The regional approach represented by the RSWTF is potentially different, not only because it involves both the generators and the disposers of waste in a single county, but also because it is one of the first attempts in North Carolina to forge a multi-county cooperative structure to handle solid waste.

Many other states have achieved various types of regional cooperation. One New Hampshire integrated waste management facility serves thirty-nine towns, and only one facility serves the entire state of Rhode Island. Often, however, these states have higher tipping fees, smaller geographic areas, and different local government structures. In contrast, the RSWTF is neither dictated by the state as in Rhode Island, nor born of economic necessity as in New Hampshire, but is an independent attempt to achieve cost-effective environmentally sound regional planning.

## Structure of the Regional Solid Waste Task Force

The final composition of the RSWTF included both official and citizen representatives from the towns and

counties involved, as well as a representative from the physical plant of the University of North Carolina at Chapel Hill. UNC contributes over twenty percent of Orange County's waste stream and is considered an essential participant in any solid-waste planning effort. Therefore, one representative from the university physical plant was invited to participate. Each county sent two citizen representatives, and one elected official and one staff member represented each governmental jurisdiction--Durham County, Orange County, the towns of Carrboro and Chapel Hill, and the city of Durham.

## Purpose of the Task Force

The task force stated its purpose as follows:

> . . . to identify the problems of waste disposal and explore alternative solutions to those problems. The positive and negative aspects of each should be evaluated while keeping in mind cost-effectiveness, environmental sensitivity, and the political realities they affect. With such information at hand, the task force will draw conclusions to present to those governing bodies they represent.

The RSWTF appointed a technical subgroup to act as its staff. This group included the Public Works Directors of Chapel Hill, Carrboro, and Orange County, the solid waste planners for Orange County, Carrboro and Chapel Hill, the Durham Sanitation Department Assistant Director, the Durham County General Services Director, the Carrboro Town Manager, and the Assistant Physical Plant Director from UNC. These are all RSWTF members.

## The Study Process

The RSWTF met monthly from June 1986 onward. After a request-for-qualifications process, they selected HDR Engineering as the engineering consultant to define the feasible options for solid waste management.

The RSWTF developed an initial charge which was refined through discussions with the consultant. The consultant then completed the required studies and wrote a solid waste report. Hearings were conducted in January 1988 in Durham and Chapel Hill to obtain public input to the study. A clear consensus emerged in favor of maximizing recycling efforts. In Durham, the speakers also focussed on opposition to a potential waste incinerator. In the Orange County hearing, more opposition to landfills was expressed.

## Recommendations by the Consultant

HDR presented the preliminary report chapter-by-chapter to the task force. The technical group of the task force reviewed the consultant's work, and brought its recommendations back to the full RSWTF. Working together, the task force and the consultant developed a final report. This process spanned a two-year period from its beginning in November 1986 through acceptance of the consultant's final report by the task force in November 1988.

HDR's report recommended the following. Some estimated costs are noted. Both counties will likely finance most study costs from tipping fees.

1. Develop a plan to reduce wastes and increase recycling in all jurisdictions to reach a minimum goal of twenty-five percent recycling in Orange County and twenty percent in Durham County by 1998.
2. Initiate a search for a new landfill site in Orange County with at least a ten year capacity. Study should include full public participation. ($155,000)
3. Study and evaluate in more detail the potential of the following technologies for reducing solid waste volume:
   a. Regional refuse-derived fuel production (RDF) facility. ($10,000)
   b. Regional waste-to-energy (WTE) mass burn facility. ($85,000)
   c. Compost/landfill facilities either regional or for each county. ($50,000) Compost should include both municipal solid waste and sludge.
   d. Waste Characterization Study for both counties. ($50,000)
4. Evaluate participation in a larger waste-to-energy project involving Wake County.
5. Evaluate mechanisms (creation of an agency, for example) to establish a regional solid-waste management program.
6. Evaluate waste-flow control mechanisms to direct all refuse haulers in the jurisdictions to deliver waste to a specified solid waste disposal facility or facilities.
7. Develop a comprehensive waste-management plan which will include recycling, waste reduction, and reduction in the volume of waste remaining after recycling.

A second public hearing was held in December 1988 to publicize these recommendations. A public information piece was released in conjunction with it. Many of those who attended and spoke at the hearing voiced support for increased recycling efforts. There were several speakers who opposed construction of an incinerator to reduce waste volume. Interestingly, locally based Environmental Protection Agency researchers on solid waste incineration voiced their personal opinions that solid waste combustion was both safe and effective.

The RSWTF then presented its own report and recommendations to the governing bodies in these two counties. This report to the elected officials and the public became in large part the work plan of the RSWTF.

## Conclusions on the Durham-Orange Regional Solid Waste Planning Efforts

1. Regional solid waste planning works best when interests, economics of solid waste management, and timing of the need for new solid waste management facilities are mutual among jurisdictions. This is the case for Durham and Orange Counties. Both the Durham and Orange landfills are in a rapid growth area with competing land interests, and their tipping fees and operating costs are similar. In addition, both counties' landfills are scheduled to reach capacity around 1997.
2. The process is twice as long and twice as expensive as had been originally anticipated. The task force first convened in July 1986 and now expects to continue meeting for at least another year--longer if a solid waste management agency is not formed. Continuity in the process has been, and will continue to be, extremely important through the three phases of the study: feasibility assessment (now complete), identification of site-specific, technology-specific options (planned for 1990) and final site selection, risk assessment, design, and engineering.
3. The means of moving from a planning process involving two counties and three municipalities to a working agency handling regional solid waste problems is still unresolved at this time. There is no direct precedent in North Carolina for a multi-county solid waste management agency. (Note that it is not called an *authority*.)
4. Development of the formula used to pay for all this work is part of the politics of regional planning.
5. The waste volume reduction option(s) identified by the engineering consultants will not necessarily entail a regional facility, a two-county regional approach, or the same approach for each county.
6. There are other approaches to the problem of solid waste management. Some are engineering oriented, some are political, some are expedient. All are costly. Alternatives to sanitary landfilling as the primary method of disposal are driven primarily by the increasing regulation of landfills, the "Not-In-My-Back-Yard" syndrome, and the availability of sufficient suitable land.

## Conclusion

The process of moving towards regional solid waste management solutions is long, arduous, and uncertain. The mechanisms to achieve true regional solutions do not yet exist in North Carolina. They will be invented and will evolve as needed. The solutions which are developed by the Durham-Orange RSWTF will include not only the technical aspects of waste reduction, recycling, composting, incineration, and RDF production, but also financing and institutional arrangements which will be innovative and ground breaking for our state.

## Update: October 15, 1989

At present, the RSWTF has requested and received proposals to conduct a solid-waste characterization study in each of the two counties. The studies will begin in January 1990. A request for qualifications is now being developed to select a lead consultant for detailed technical study of RDF markets, municipal solid waste composting, and incineration. The Orange Regional Landfill Owners' Group is concomitantly developing a process to select a potential site or sites for the next landfill in Orange County.

---

**Blair L. Pollock** is the solid waste planner for the Orange Regional Landfill Owners' Group consisting of the towns of Carrboro and Chapel Hill and Orange County. He is on the Board of Directors of the North Carolina Recycling Association and is the Solid Waste Chair for the N.C. Chapter of Sierra Club. Mr. Pollock is a 1978 graduate of the Department of City and Regional Planning, University of North Carolina at Chapel Hill.

# Recycling Plastic Containers: What's Happening in North Carolina

**Sandi Maurer**

*Many types of plastics including polyethylene terephthalate or "PET", the material of plastic bottles are now recyclable. The National Association for Plastic Container Recycling (NAPCOR) provides assistance to cities wishing to recycle PET. Now, a North Carolina company, Southeastern Container, is giving assistance to smaller communities. This article briefly describes the recycling assistance available and cites current examples.*

## Introduction

The trend toward expanding recycling activities is a positive response by communities, local governments, and businesses to the solid waste crisis in the United States. Many recycling programs include glass, aluminum, newspaper, and perhaps corrugated cardboard or office paper. Few programs planners realize that plastic is recyclable as well. Both PET (polyethylene terephthalate) and HDPE (high-density polyethylene) plastics can now be included in recycling programs. In fact, post-consumer PET bottles and HDPE milk and juice containers are in high demand by processors who recycle these materials into valuable, high-quality consumer products.

## Current Status of Plastics Recycling

In 1988, 175 million pounds or twenty percent of all PET bottles manufactured were recycled. Nearly thirty per,cent by volume of all soft drinks sold are packaged in plastic bottles. By weight, PET bottles contribute about two-tenths of a percent to the solid waste stream, but by volume, PET bottles actually contribute about five percent.

Recycled PET bottles can be remanufactured into fiber-fill stuffing for pillows, jackets and vests, see-through egg cartons, carpet face yarn and backing, strapping, and engineering plastics. Currently, recycled PET is not used to make new soft drink bottles, however, it is used for non-food applications such as detergent bottles. The quality of the end products made from the recycled PET is reported to be very good. In 1988, the Plastic Bottle Institute identified 130 companies as recycled plastic brokers and processors.

## The National Association for Plastic Container Recovery

The National Association for Plastic Container Recovery (NAPCOR), based in Charlotte, North Carolina, is a nonprofit trade association formed in 1987 to encourage plastic container recycling. NAPCOR's goal is to recycle fifty percent of all PET bottles by 1992. To reach this goal, NAPCOR provides promotional materials, technical assistance, and marketing assistance to communities interested in incorporating PET into recycling programs.

For programs which generate large amounts of PET bottles, NAPCOR provides more extensive assistance. These programs are usually located in states with solid waste crises, large populations, and well-established voluntary or mandatory recycling programs. Of these, NAPCOR concentrates on communities with curbside recycling programs.

Depending on the needs of the community, NAPCOR may contribute funds to purchase trucks and equipment, for promotion and publicity, and for education. NAPCOR also provides a list of market contacts and information on how to prepare the materials for market so that communities have outlets for their materials. NAPCOR itself does not handle or purchase material from recycling programs.

## Southeastern Container

Southeastern Container (SEC) is the third largest manufacturer of plastic soft drink containers in the United States. SEC makes sixteen-ounce, one-liter, two-liter, and three-liter size bottles for the Coca-Cola company at its plant in Enka, North Carolina. SEC makes ten percent of all PET bottles used to package soft drinks nationwide.

Currently, the plastics recycling industry lacks sufficient middlemen to broker and process small quantities of recycled PET for reuse. This has made it difficult for smaller communities to include PET in their recycling programs. Even recyclers who are aware that these materials are marketable often need assistance in designing an efficient collection system and in locating a market for the PET material. SEC has recently begun to provide technical assistance in these areas. In addition, the company acts as a buyer/broker for PET collected in quantities too small for normal wholesale dealers.

*Workers sort plastic bottles for recycling at the central processing facility in Mecklenburg County.*

SEC's philosophy as a manufacturer of PET bottles is to be responsible for the entire life cycle of the packaging material; PET bottles should be recycled and reused for new consumer products. To insure that the opportunity exists to recycle PET bottles in multi-material recycling programs, SEC is providing technical and marketing resources, and in some cases start-up funds for PET recycling programs. SEC itself recycles all in-plant scrap, including cardboard, plastic film, office paper, and other office materials.

SEC, a member of NAPCOR, assists in its efforts; however, SEC uses different criteria than does NAPCOR in providing support to programs. SEC offers greater assistance to smaller programs. Through their brokerage program, SEC hopes to assist new programs until volumes become great enough to enable a community to market its PET independently.

## Recycling Programs

NAPCOR and SEC are currently providing recycling assistance to the following communities in Georgia and North Carolina:

*Charlotte and Mecklenburg County, North Carolina*

Coca-Cola Consolidated of Charlotte began supporting PET materials collection for this program in 1987. Since then, NAPCOR and SEC have both joined the effort.

The county's curbside recycling program started in February, 1987 as a pilot program. Participation in the program is voluntary. Recovery rates increased rapidly in the initial two years of the county program, with twenty tons of PET recovered in 1988, increasing to fifty-five tons in 1989, indicating a growth in public awareness of and participation in recycling programs.

The county markets its materials independently with promotional assistance from NAPCOR. SEC and Coca-Cola have provided densifying equipment for the plastic bottles.

*Gwinnett County, Georgia*

The Recycling Bank of Gwinnett (RBG) was constructed in 1986 to serve as a community buy-back recycling center. The RBG is a project of both the *Gwinnett Clean and Beautiful* and *Keep America Beautiful* programs.

SEC provides densifying equipment and storage facilities for the PET material collected at the RBG. SEC pays a fair market price for the PET material which enables Gwinnett Clean and Beautiful to purchase PET material directly from the public. NAPCOR provides promotional assistance.

*Western North Carolina*

SEC provides technical assistance and purchases materials from several small county and municipal programs in Western North Carolina.

In Brevard, a community of 6,000 people in a county with a total population of 21,000, SEC provides collection containers for PET bottles at the solid waste and recycling drop-off sites. The material is removed from the sites and stored by a local scrap dealer. An SEC employee regularly collects and pays the scrap dealer for the PET material. The scrap dealer does not separate the bottles or densify them in any way; the price paid to the dealer reflects the condition of the bottles. For bottles which are separated by color and not mixed with other plastics, the price may be higher.

Currently this program collects approximately eight hundred pounds of PET material per week, including milk jugs and soda bottles. The bottles are then transported to Asheville for processing and eventual resale to companies which reclaim the material and reform it into new products. Similar programs operate in Hendersonville, Henderson County, Asheville, and Buncombe County.

SEC works with recyclers in distant counties to combine loads of recyclables to reduce shipping costs. Creative ways

to include PET recycling in existing or planned recycling programs are examined for smaller communities who request assistance in recycling PET material.

*Durham, North Carolina*

Sun Shares, a nonprofit recycling and energy conservation company, is completing the first year of a three-year contract with the city and county of Durham to provide recycling dropoffs, curbside recycling collection, and commercial recycling. Sun Shares' program includes thirteen multi-material drop-off locations at shopping centers and curbside recycling pick-up for fourteen-thousand homes. Anopther four thousand homes will be added by July of this year.

SEC is investigating the possibility of collecting PET soft drink containers from Sun Shares' drop-off centers and curbside program. As with other larger programs, SEC has offered to provide Sun Shares with a storage trailer, shipping, and a guaranteed market for the material.

## Conclusion

Although North Carolina programs have been the focus of this report, SEC also supplies bottlers in other southeastern states with PET bottles. NAPCOR is very active in recycling programs in Florida communities. NAPCOR and SEC hope to also establish or include plastic in existing recycling programs in Greenville/Spartanburg, Columbia, and Charleston, South Carolina this year. The company is also investigating PET recycling interest of the other states in its market area--Tennessee, Virginia, Alabama, and Mississippi.

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As Recycling Manager for Southeastern Container, **Sandi Maurer** educates communities about the recyclability of PET containers and assists interested communities in setting up recycling programs. Prior to her work with SEC, Ms. Maurer worked in Asheville, N.C. for the Land of Sky Regional Council, a multi-county planning agency, as Solid Waste Programs Planner.

## North Carolina Passes New Law Mandating Recycling

Over this past summer, the North Carolina General Assembly approved the *Solid Waste Management Improvements Act of 1989*. The act involves local governments, state agencies, and the private sector in an effort to recycle 25% of North Carolina's solid waste by the middle of 1993. Regulations cover four main areas: scrap tires, solid waste recycling, landfill fees and closure, and used oil recycling.

The act establishes the following schedule for implementing some of its provisions:

| | | |
|---|---|---|
| 1990 | *January 1*..... | Begin one percent state tax on new tire sales to help fund tire disposal. |
| | | All pull-tab beverage cans prohibited. |
| | *March 1*..... | Disposal of scrap tires in landfills prohibited. |
| | | Limit scrap tire disposal to one designated site per county. |
| | *October 1* ..... | Disposal of waste oil in landfills prohibited. |
| | | Local governments operating solid waste management facilities must publish report on solid waste management. |
| 1991 | *January 1*..... | Large appliances and lead-acid batteries prohibited in landfills. |
| | *July 1* ..... | Local governments must establish solid waste recycling programs. |
| | | All solid waste must be weighed before disposal in landfills. |
| 1992 | *March 1*..... | Local governments must submit biennial solid waste plans. |
| 1993 | *January 1*..... | Yard trash prohibited from landfills. |
| | *July 1* ..... | Local governments must acheive twenty-five percent solid waste recycling. |
| 1996 | *January 1*..... | All landfill operators and recycling coordinators must have completed a state-certified training program. |

The act further requires proof from landfill operators that sufficient funds will be available to properly close a landfill when it is full. It provides incentives for establishment of waste-oil recycling centers. Finally, the act establishes performance criteria and certain certification and reporting requirements for local and state entities to demonstrate compliance.

This information has been extracted from a summary of the provisions of the law and its implications for local governments prepared for the North Carolina Association of County Commissioners by Ed Regan, NCACC Assistant Executive Director. NCACC has offered to provide copies of this informative twelve-page summary to interested readers at no charge. Send your request for the "Summary of Senate Bill 111" to:

North Carolina Association of County Commissioners
Attention: Ed Regan
P.O. Box 1488
Raleigh N.C. 27602

# Privatization of Public Housing Projects Using Section 123 of the Housing and Community Development Act of 1987

**Dennis Eisen**

*Recent legislation allows public housing projects to be sold to the tenants. This article describes the requirements of this process, and factors which must be taken into consideration in assessing the feasibility of a sale. The author presents two case studies of privatization of existing public housing projects. He describes how their purchase and rehabilitation are being financed, and points out that educational and social issues must also be addressed in order to ensure long-term economic viability for such conversions.*

## Introduction

A significant portion of the nation's public housing is now over forty years old. A great many of these older projects have deteriorated to the point where renovation will not suffice to restore the buildings to decent, safe, and sanitary housing. Apathy, neglect, drugs, unemployment, and other factors are so much a part of the public housing problem that radical new approaches are necessary.

Recognizing this, Congress and the Department of Housing and Urban Development (HUD) enacted legislation in 1987 which would permit public housing residents to purchase their projects from the government. Residents would take complete control over the renovations and financial management of the property. They would have total responsibility for setting and maintaining self-sufficiency goals, determining their own destiny, and ultimately making the project a vibrant community.

The process of "privatization" was recently given substantial support through the establishment of an Office of Resident Initiatives within HUD's Office of Public Housing. The Office of Resident Initiatives is encouraging tenant groups in scores of projects nationwide to participate in this movement.

As of fall 1989, applications for purchase have been filed by tenant groups in two large public housing projects in Washington, DC and St. Louis, Missouri. Because public housing projects are administered locally, no nationwide statistics are available as to the number of projects currently under resident management. Nevertheless, it is anticipated that as many as a dozen large projects, in addition to numerous smaller ones, will apply for privatization each year as the program gains momentum.

In order to qualify for purchasing projects under Section 123, residents must be organized as a not-for-profit Resident Management Corporation (RMC). As the RMC, residents must have served as the management agent for the project under contract with the Public Housing Authority (PHA) for at least three years.

As part of the overall requirements of sale, the PHA must certify that it will replace all units sold to an RMC within thirty months, either through development of new units or modernization of vacant units by the PHA; or, through acquisition of existing privately owned units by the RMC to be operated as rental housing using tenant income and rent limitations comparable to those for public housing.

Before a sale can be effected, there are numerous conditions that Section 123 imposes on the property and parties involved. These include replacement and resale rules; and livability, affordability and eligibility considerations. This article focuses on the difficult question of how to finance such sales.

Although HUD administers the overall public housing program, individual public housing projects are actually supervised by local PHAs. Section 123 specifies that the PHA must negotiate with any qualified RMC that wishes to purchase a project. Once the local PHA and the RMC have tentatively agreed on a purchase price, HUD must approve the deal. HUD must take into account the property's fair market value, and the ability of the residents to purchase and maintain it. If a project meets these review criteria, HUD must approve the sale.

Once an agreement is finalized, the RMC may freely sell individual units to project residents or other qualified low-income families residing in or waiting for public housing. However, the proceeds from sales are to be retained by the PHA for the express purpose of increasing the number of public housing units available for occupancy.

The initial privatization of such projects is but the first step in a conversion process whose goal is to provide homeownership opportunity to public housing residents. Section 123 permits ownership to be of any form or arrangement, including limited dividend cooperative, condominium, fee simple, or shared appreciation. In a limited

dividend cooperative the project is jointly owned by the residents, analogous to the way a corporation is jointly owned by shareholders. Residents own a share of the project and pay rent to the RMC. Residents may freely sell their share in the project and move out; however, part of the proceeds from the sale will revert to the co-op organization. In condominium ownership, each unit is individually owned by the resident. Residents pay dues to an owners' association for general maintenance of commonly owned areas and exterior building maintenance. Neither fee simple ownership nor shared appreciation have yet been tried in public housing projects.

Regardless of which form of ownership is adopted, planners and other technical assistance providers must ensure that the RMC will have sufficient resources at its disposal to operate the project.

## Case Studies

In the fall of 1988, technical assistance contracts were provided by HUD to the National Center for Neighborhood Enterprise (NCNE) in Washington, DC to help with the privatization of two public housing projects: the 464-unit Kenilworth-Parkside Apartments in Washington, DC and the 485-unit Carr Square Village Apartments in St. Louis, Missouri.

The technical considerations of privatizing the first two public housing projects were so great that three subcontractors were engaged to augment NCNE staff. The real estate consulting firm of Dennis Eisen & Associates conducted a detailed feasibility analysis and prepared the economic projections. A second real estate consultant, MPC & Associates, drafted the disposition application and numerous other forms. Paul Pryde, an economic development consultant, assisted with each project's self-sufficiency plans. The law firm of Arnold & Porter drafted the legal agreements and other formal documents.

It has taken years for housing advocates to sell the concept of privatization to the Administration and Congress. Once the law was finally enacted--as part of the Housing and Community Act of 1987--many more months of work were needed to bring the parties in the first actual sale to the negotiation and contract table. The purpose of this paper is to describe a few aspects of the process to date for the above-mentioned projects, namely, the setting of the purchase price, the sources of construction funding, the investigation of overall economic feasibility, and the elements of the self-sufficiency plan.

## Purchase Price

In accordance with Section 123, fair market value is one of the principal factors considered in setting the purchase price of a project. If this had been the only factor, the purchase price of the two properties would have been in the millions of dollars. At Kenilworth-Parkside, estimates of reasonable tenant contributions (at 30 percent of income) came to about $1.35 million with current operating expenses of $1.72 million, resulting in an anticipated shortfall of $370,000 per year. At Carr Square Village, the estimate of tenant contributions came to just over $1 million with operating expenses of $1.25 million, resulting in a projected shortfall of $250,000 per year. This meant that the residents could not afford to cover the operating expenses of the projects. The additional assumption of a mortgage was naturally out of the question. Therefore, the final negotiated price in each instance was eventually set at one dollar.

## Construction Funding

Both Kenilworth-Parkside and Carr Square Village required extensive rehabilitation to bring the units up to proper condition. The funds to do this came from two vastly different sources. At Kenilworth-Parkside, $23 million in funds for modernization were provided by HUD through a Comprehensive Improvement Assistance Program (CIAP) grant. At Carr Square Village, the $29.5 million needed for modernization will come from a variety of sources, including borrowed funds from the private sector and the sale of tax credits to corporate investors. Only a small portion of the funds were initially provided through private foundation or government grants. Because of the private sector involvement, the Carr Square Village endeavor will most likely be organized as a joint venture between the RMC, developer, and corporate investors.

## Economic Feasibility

Even though the projects are being sold at essentially zero cost, residents will not be in a position to carry them financially until their average incomes have increased. This will be facilitated through concentrated job training and other economic development activities. There will be a need for heavy ongoing post-sale subsidies to replace the annual government subsidies which were previously used to close the gap between revenue and operating expenses from when the projects were operated as public housing. Moreover, there is the additional expense of debt service payments on the mortgage(s) used to rehabilitate Carr Square Village.

The consultants used detailed information--Section 8 fair market rents, utility allowances, operating expenses, mortgage payments, overall tenant contributions--to determine the future level of subsidies needed for each site

once modernization is completed.

A computer model was developed to simulate the long-term economic operation (two or more decades from the day of sale) of a public housing project. By varying the depth and extent of Section 8 subsidies, this model made it possible to (1) determine the overall level of post-sale financial assistance necessary to provide enough net operating income to support mortgage payments on any funds borrowed, and (2) determine the necessary cash flow each year to create operating reserves in anticipation of the expiration date of Section 8 subsidies. With this information, the key issue from an economic feasibility standpoint became whether the projected revenues from tenant contributions and investment income (from the operating reserve fund) would cover operating deficits in perpetuity.

Since mostly borrowed funds will be used to modernize Carr Square Village, the model predicted a post-sale subsidy period of fifteen years. During this time, Section 8

## A Checklist for Planners

The article describes four elements of the privatization process--purchase price, construction funding, economic feasibility, and self-sufficiency plan--which are only part of the lengthy, complex path towards ultimate homeownership for housing residents.

The following checklist provides a more complete view of the steps, activities, and considerations that must be taken into account when providing technical assistance to public housing projects and their Resident Management Corporations.

**I. Preliminary Qualifications for Privatization**

*A. Qualification of Resident Management Corporation*
1. Must be incorporated
2. Must be resident controlled
3. Must have a management contract with the PHA
4. Must have managed the property for at least 3 years
5. Must have appropriate management and fiscal procedures and controls
6. Should have secured tax-exempt status to assist in securing foundation grants.

*B. Required Project Financial and Descriptive Data*
1. Will all or only a part of the project be purchased?
2. Does it meet livability standards?
3. What rehab or modernization is needed to meet standards?
4. What is current operating income from tenants and the ACC?
5. What are current operating costs?
6. Encumbrances and liens?

*C. Description of Current Supporting Programs*
1. Day care
2. Job training and placement
3. Elderly services
4. Tutorial and youth services

**II. Technical Assistance Studies Needed**

*A. Initial Feasibility Analysis*
1. Demographic Survey
2. Revenue and operating expense projections
3. Debt service considerations
4. Rental subsidy and reserve fund projections
5. Overall economic forecast

*B. Preliminary Economic Development Plan*

*C. Self-Sufficiency Plan*

*D. Application to PHA and HUD*

*E. Development and Financing*

*F. Initial Legal Work*

*G. Marketing Plan for Rehabilitated Units*

*H. Coordination with HUD and other agencies*

**III. Factors Involved in Completing Disposition Application**

*A. Meet Local Public Housing Authority Requirements*
1 Meet requirements of HUD Disposition Handbook
2. Prepare replacement plan
3. Prepare relocation plan
4. Determine sale price
5. Hold public hearing

*B. Establish Local Government Cooperation*
1. Obtain Mayor's letter of support
2. Request phase-in or abatement of real estate taxes

*C. Provide Assurances of RMC Competency*
1. Economic development assurance
2. Management capability assurance

*D. Identify Funding Sources For Rehab or Modernization*
1. Federal programs (CIAP, etc.)
2. State and local government programs
3. Private sector sources

*E. Identify Funding Sources For Operations*
1. Section 8 (if requirements are met)
2. Income from reserves
3. Revenue from other operations
4. Foundation and government grants

certificates will be needed for all 485 units in the first five years; for 380 units in years six through ten; and for 260 units in years eleven through fifteen. No post-sale assistance is planned or anticipated beyond the fifteenth year.

Because the funds needed for the modernization of Kenilworth-Parkside are provided by HUD through a CIAP grant, the model showed that the particular combination of Section 8 certificates and vouchers would no longer be needed after the fifth year of operation.

## Establishing Self-Sufficiency

A self-sufficiency plan, one of the most important supporting documents, must accompany the application for sale. It is a comprehensive, well-coordinated document containing plans for economic development, project rehabilitation, homeownership costs, resident participation, and project management.

*F. Factors Determining Economic Feasibility*
1. Adequacy of financing
2. Self-sufficiency schedule
3. Long-term economic forecasts

**IV. HUD Functions**
*A. Provide Technical Assistance Funds*
*B. Approve Sale Price*
*C. Approve Application at All Levels*
1. Field office
2. Regional office
3. Headquarters
*D. Grant Section 8 Subsidies*
1. Allocation of certificates and vouchers
2. Waiver/adjustment of Fair Market Rent (FMR) limits
3. Renewability pledge

**V. Approve Contract of Sale**
*A. Draft Document*
*B. Negotiate Terms*
*C. Ratify Final Document*

**VI. Requirements for Joint Ventures with Outside Investors (if relevant)**
*A. Agreements*
1. Memorandum of Understanding between RMC and private sector partners
2. Approval by HUD and PHA of joint venture
*B. Descriptions*
1. Nature and form of partnership
2. Duties, responsibilities and ownership
3. Identification of outside/limited partners
4. Intended sources of equity and debt capital
5. Use and sale of tax credits

**VII. Requirements for CIAP-Funded Projects (if relevant)**
*A. Include Rehab Needs in PHA's 5-year Plan*
*B. Prepare Preliminary Application*
*C. Prepare Final Application*

**VIII. Requirements for HUD Section 5(h) Co-ops (if relevant -- see legislation)**

**IX. Closing**
*A. Conditions Required Preceding Closing*
1. Financing obtained for rehab or modernization
2. CIAP completed (if applicable)
3. Contingencies removed
4. All approvals obtained
*B. Transaction Procedures.*
1. Earmark Section 8 assistance for recapture
2. Phase out Annual Contributions Contract
*C. Steps for Transfer of Title*
1. Title work and preparation of papers
2. Settlement and recording

**X. Economic Development Plan**
*A. Develop detailed economic development plan*
*B. Develop coordinated implementation strategy*

**XI. Homeownership**
*A. Select Homeownership Form*
1. Limited dividend co-op
2. Leasing cooperative
3. Condominium
4. Other arrangements
*B. Provide Training Appropriate to Ownership Form*
*C. Plan Timing of Conversion*
1. Must be synchronized with self-sufficiency and economic development plans
2. Must arrange timing to meet legal restrictions to qualify for tax credits
*D. Plan for Sales to Individual Residents*
1. Establish criteria for selecting purchasers
2. Sales price of apartments or co-op shares
3. Associated fees for training or membership
4. Reimbursement of proceeds to the PHA
*E. Plan for Secondary and Subsequent Sales*
1. Establish limitation on resale prices
2. Develop equity sharing formulas

A self-sufficiency plan must include, for example, an economic development plan stating how the RMC should identify the type of job skills in demand in the surrounding metropolitan area; how and where residents can develop these skills; methods for job placement or small business start-ups; and how additional supporting programs such as day care and transportation can be funded and operated. The components of the economic development plan must be well-coordinated so that the self-sufficiency plan is implemented in a logical sequence. For example, employers and their needs must be identified before job training programs can be initiated. Otherwise, the effort will be largely wasted and the residents discouraged.

Furthermore, the self-sufficiency plan must show how the residents can become involved and participate in the overall privatization process in order to understand limited dividend cooperatives (or other forms of ownership), and the rights and responsibilities of ownership.

The self-sufficiency plan does not need to contain a great level of detail, but must convince local and federal officials that the RMC knows what to do, how to proceed, and has a firm set of benchmarks against which to measure progress in the path towards self-sufficiency.

## Next Steps

It is anticipated that the Bush Administration will provide technical assistance funds permitting the purchase of five to ten public housing projects by their respective RMC each year. A technical manual, based on the Kenilworth-Parkside and Carr Square Village experience, will be developed to help make the process of "going private" more efficient for future RMCs.

The elements of the privatization process described in this article--purchase price, construction funding, economic feasibility, and the self-sufficiency plan--are just four of the steps in a lengthy, complex path towards ultimate homeownership for public housing residents. Consult the checklist included with this article to better understand the process for privatizing public housing projects.

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## Articles

# Pedaling Into the Future

**Marcia D. Lowe**

*The bicycle has the potential to help free the cities of the world from choking on the pollution and traffic congestion of the automobile, and to offer short-range, individualized travel at a low cost to the billions who will never be able to afford a car. A growing number of nations are realizing that in a world of finite resources--petroleum, land, and clean air--the bicycle is the vehicle of the future.*

Traffic noise in Beijing means the whirring of bicycle wheels and tinkling of bells. The streets of New Delhi come alive with thousands of bicycle commuters each day. Office workers in New York City depend on bicycle messengers to cruise past bumper-to-bumper traffic and deliver parcels on time. And police officers in Seattle often find bicycles better than squad cars for apprehending criminals on gridlocked downtown streets.

Outside the city, bicycles also play a vital role. Kenyan dairy farmers cycle through remote regions with milk deliveries, and Nicaraguan health workers on bikes now reach four times as many rural patients as they did on foot.

Whether a cycle rickshaw in Jakarta or a ten-speed in Boston, pedal power plays a key role in transportation. The bicycle is fast becoming the only way to move quickly through congested urban traffic, and the only affordable personal transport in the developing world, where an automobile may cost more than a worker earns in a decade.

Despite its demonstrated utility, the bicycle has been formally neglected by transport planners in almost every country on the globe. Only China and a few Western European nations collect transportation data that count bicycles among forms of transport. In the case of the United States Department of Commerce, neglect might be a promotion in status for the bicycle; the department refers inquiries on bicycle trade to its Division of Toys and Games.

The World Bank, the main source of urban transport investment in the developing world, published a 1985 study on the Chinese transport sector that does not even mention the word bicycle, although the overwhelming majority of trips in China's cities are made by bike. This is sadly typical of a policy environment in which only motor vehicles are taken seriously.

### High Price for Mobility

The automobile has long been considered the vehicle of the future. Indeed, it has brought industrial society into the modern age with a degree of individual mobility and convenience not known before. But overreliance on the car is backfiring as too many cars clutter city streets and highways, bringing rush-hour traffic to a standstill. The side effects of massive oil use show up not only in economy-draining import bills but in deadly air pollution in cities, acid rain in dying lakes and forests, and hastened global warming.

In their enthusiasm for engine power, transport planners have overlooked the value of human power. With congestion, pollution, and debt threatening both the industrial and developing worlds, the vehicle of the future clearly rides on two wheels rather than four. The bicycle's ascent would not eliminate automobiles, or any other vehicle, but would instead integrate bicycles with cars and mass transit. A well-balanced, diverse transport system could help save precious oil and other resources, reduce pollutants, and provide mobility to people with few or no alternatives to walking. Before this can happen, though, a shift in attitudes must take place.

### More Bikers Than Drivers

Bicycles already outnumber cars worldwide by two to one, with most of the 800-million-bicycle fleet concentrated in the Third World, particularly China and India. In the United States, where one of every two people owns an automobile, bicycles are mainly used for recreation or, at

best, supplementary transportation. At the other extreme is China, with one privately owned car for every seventy-five thousand people. Chinese commuters have little choice but to make the most of their bikes.

By bicycle standards, China is in a class by itself, with some 270 million bicycles, or roughly one for every four people. In urban areas, half the residents have bicycles. Traffic monitors at an intersection in the northern industrial city of Tianjin once counted more than fifty thousand bicycles pass in an hour.

The bicycle fleet in China has nearly tripled since 1979, largely as a result of rising incomes. Domestic bike sales in 1987 reached thirty-five million units, actually exceeding total worldwide automobile sales. Bicycles are popular in China because, like cars in industrial countries, they offer the luxury of individual mobility and independence, and door-to-door travel without detours or extra stops for other passengers. When the same trip would take equal time by bicycle or mass transit, Chinese prefer to bike.

Bicycles are also popular because Chinese transportation planners in the sixties and seventies used subsidies, paying commuters a monthly fee for bicycling to work, to relieve the pressure on crowded buses and to postpone public transit investment. This policy, however, failed to foresee the bicycle boom of the eighties.

*Cycle trishaws in Canton (Guangzhou), China*

Now Chinese cities face a phenomenon in which people's appetite for individual mobility is becoming an obstacle to mass mobility. Like car commuters in the industrial countries, bicycle commuters are now officially encouraged to use the expanded fleet of public buses for longer trips.

Bicycles transport more people in Asia alone than do automobiles in all countries combined. Throughout the continent, ingeniously rigged two- and three-wheelers accomplish much of what automobiles do elsewhere. With the help of trailers, baskets and load platforms, pedal power hauls everything from sacks of rice to piles of bricks. Cycle rickshaws are the taxis of Southeast Asia, while sturdy tricycles are the light trucks that haul loads of up to half a ton. In Bangladesh, cycle rickshaws transport more tonnage than all motor vehicles combined.

In urban areas, bicycles are the primary means of commuting. In the countryside, they help peasants drastically cut down on the time needed to transport water and fuelwood. In many Asian cities, two-thirds of the vehicles on the road during rush hours are bicycles.

## Shunned, Feared and Neglected

The rest of the developing world lags far behind Asia in using bicycles. Particularly in Latin America, the prestige and power of auto ownership has hypnotized governments into ignoring pedal power and led citizens to scorn the bicycle as a vehicle for the poor.

African farmers depend heavily on bicycles, but relatively few urban residents do. The few who are able to buy a bicycle are discouraged by official disdain or even bans on their use. In some African countries it is taboo for women, the main haulers of food, water, fuel and children, to ride bicycles.

Several heavily polluted Eastern European countries are taking modest steps to expand the bicycle's role in easing the burden on the environment. In Poland, a plan for a bicycle system in the city of Poznan calls for a 124-mile network of bicycle paths by 1990. Bicycle production in Poland has more than doubled in the last two decades, and demand still exceeds supply. In 1979, the Lithuanian city of Siauliai launched a comprehensive program to encourage cycling, the Soviet Union's first, which included a bicycle-path system and extensive parking facilities.

A surprising share of the world's bicycles is found in developed countries, surprising, only because of the small number found on typical city streets. In several European countries, among them Denmark, West Germany and the Netherlands, there are more bike owners than nonowners. The United States had some ninety-five million bicycles in

1985, second only to China. Bicycle ownership in the industrial world does not necessarily mean bicycle use. One in four Britons has a bicycle, yet only one transport trip out of thirty-three is made by bike. Only one out of fifty bicycles in the United States is used for commuting; most of the rest are ridden by children and sports enthusiasts, or collecting dust in the basement.

A comparison of bicycle and automobile ownership by country shows the relative dependence on the bicycle (see Table 1). The United States, for example, has more than twice as many bicycles as India, but only a fraction of American bicycles get as much use. India's growing middle class of office and factory workers is more likely to get to work by bicycle than any other form of transport.

**Table 1. Bicycles and Automobiles in Selected Countries, circa 1985 (In Millions)**

| Country | Bicycles | Autos | Cycle/Auto Ratio |
|---|---|---|---|
| China[1] | 300.0 | 1.2 | 250.0 |
| India | 45.0 | 1.5 | 30.0 |
| South Korea | 6.0 | .3 | 20.0 |
| Egypt | 1.5 | .5 | 3.0 |
| Mexico | 12.0 | 4.8 | 2.5 |
| Netherlands | 11.0 | 4.9 | 2.2 |
| Japan[1] | 60.0 | 30.7 | 2.0 |
| W. Germany | 45.0 | 26.0 | 1.7 |
| Argentina | 4.5 | 3.4 | 1.3 |
| Tanzania | .5 | .5 | 1.0 |
| Australia[1] | 6.8 | 7.1 | 1.0 |
| U.S.[1] | 103.0 | 139.0 | .7 |

*Sources*: Worldwatch Institute, based on Motor Vehicle Manufacturers Association, *Facts and Figures* (Detroit, Mich: various editions); MVMA, various private communications; United Nations, *Bicycles and Components: A Pilot Survey of Opportunities for Trade Among Developing Countries* (Geneva: International Trade Centre UNCTAD/GATT, 1985); *Japan Cycle Press International*, various editions; and other sources.

[1]1988

*Bike lane and sign showing the way to the rail station, Karlsruhe, West Germany*

## Planning Makes a Difference

Like the United States, most other industrial countries have all but abandoned the bicycle for the automobile. Suburbanization has sprawled jobs, homes and services over such long distances that automobiles are less a convenience than a necessity. Only a handful of North American cities have extensive bike paths, and most major cities have become bicycle-proof, their roadways and parking facilities designed with only motor vehicles in mind.

Three outstanding models of nationwide bicycle planning are the Netherlands, West Germany and Japan. Local governments in these countries, spurred by traffic jams and air pollution, are demonstrating how public policy can be used to make cycling a safe and convenient alternative to the car.

The Netherlands has over nine thousand miles of bicycle paths, more than any other country. In some Dutch cities, half of all trips are made by bike. The West German town of Erlangen has completed a network of paths covering one hundred miles, about half the length of the city's streets. Bicycle use has more than doubled as a result.

Bicycle-oriented cities in Europe and Japan have boosted both bicycle and public transit ridership with facilities for carrying bicycles on buses and trains, and for parking them safely at stations. So many Japanese commuters take

advantage of this bike-to-rail option that train stations need parking towers. The city of Kasukabe now has a twelve-story structure that uses cranes to park over fifteen hundred bicycles.

## Most Efficient Vehicle Ever Built

Renewable fuels are a hot topic in transportation circles today, with concern deepening over dependence on scarce and expensive oil. In the rush to run engines on gasoline alternatives such as corn-based ethanol, transportation planners have overlooked a technology that converts food directly into fuel. A biker can ride three and one-half miles on the calories found in an ear of corn, and there is no distilling or refining involved.

Bicycles consume less energy per passenger mile than any other form of transport, including walking (see Table 2). A ten-mile, round-trip commute by bicycle requires 350 calories of energy, or three-quarters of a cup of macaroni. The same trip in the average American car uses more than half a gallon of gasoline.

**Table 2. Energy Intensity of Selected Transport Modes, U.S., 1984**

| Mode | Calories Per Passenger Mile |
|---|---|
| Bicycling | 35 |
| Walking | 100 |
| Transit rail | 885 |
| Transit bus | 920 |
| Automobile, one occupant | 1,860 |

*Sources:* Mary C. Holcomb et al., *Transportation Energy Data Book, Edition 9* (Oak Ridge, Tenn., Oak Ridge National Laboratory, 1987); President's Council on Physical Fitness and Sports, private communication, June 23, 1988.

A look at national fuel bills makes a strong case for using bicycles. In 1987, U.S. oil imports cost $43 billion, or nearly a quarter of the country's $171 billion trade deficit. Of the country's total annual oil consumption, nearly two-thirds is burned up in transportation. With world oil production declining, a country's car dependence heightens its vulnerability to impending oil price hikes.

The debt-ridden Third World is especially burdened by foreign oil dependence. Several developing countries already spend one-third to one-half of their export earnings on imported petroleum, on average about half of it going to the transport sector. By shifting to nonmotorized transport where possible, debtor nations could free their financial resources for other investments.

In 1986, a national campaign in the Netherlands encouraged drivers to switch to bicycles for trips within a three-mile radius of home. Policymakers figured this would save each motorist at least $400 a year in fuel costs. A 1980 study in Great Britain calculated that if just ten percent of car trips under ten miles were made by bicycle, the country would save fourteen million barrels of oil a year.

A 1983 study of American commuters revealed that just getting to public transit by bicycle instead of car would save each commuter roughly 150 gallons of gasoline a year. When a motorist who otherwise drives all the way to work switches to this bike-and-ride method, his or her annual gasoline use drops by some four hundred gallons, half the amount consumed by the typical car in a year. If ten percent of the Americans who commute by car switched to bike-and-ride, more than $1.3 billion could be shaved off the U.S. oil import bill.

## Urban Bane

In 1983, a unique experiment began to unfold in the streets of Bogota, Colombia. Every Sunday morning thirty-seven miles of arterial roads were closed to motor traffic

*Man on a bike in Nicaragua*

and half a million city dwellers took to the streets to bicycle, roller skate and stroll. Now in its sixth year, the weekly ritual transforms a cityscape dominated by smog and honking cars into a tranquil, clean environment.

The world's automobile-bound cities, though, are a far

cry from Bogota on Sunday. Dependence on the car exacts a toll on human health, the environment and quality of life in urban areas.

Industrial world cities typically relinquish at least one-third of their land--two-thirds in Los Angeles--to motor vehicles in the form of roads and parking lots. In the United States, this totals 38.4 million acres, more area than the entire state of Georgia. Researchers George Work and Lawrence Malone have compared the space demands of various vehicles, and according to their calculations, for a bridge of a given size to accommodate forty thousand people in one hour would require twelve lanes for cars, four lanes for buses, two for trains, and one for bicycles.

With mounting pressures on Third World countries to house and feed their swelling populations, they have little room to spare for roads and parking lots. Where people and good cropland are concentrated in a relatively small area of a country, as in China, choices are narrow. If China had the same car ownership rate as the United States--one car for every two people--it would need to devote around eighteen million acres to parking facilities alone, an amount equal to eight percent of the country's arable land.

The automobile is very much the victim of its own success, jamming urban centers and suburbs alike. Traffic congestion is eroding the quality of life in urban areas, and the amount of time wasted in traffic continues to expand in the world's cities. London rush-hour traffic crawls at an average of eight miles an hour. In Los Angeles, motorists waste 100,000 hours a day in traffic jams. Traffic engineers estimate that by the turn of the century, Californians will lose almost two million hours daily.

Urban residents from Sao Paulo to London face eye, nose, and throat irritation, asthma, headaches, and chest discomfort brought on by car-produced smog. Emissions from gasoline and diesel fuel use are annually linked to as many as thirty thousand deaths in the United States alone. It is short automobile trips--precisely the ones bike-riding could replace--that create the most pollution, because a cold engine does not fire effectively and releases unburnt hydrocarbons into the air. In the United States, where an estimated forty percent of urban commuters drive less than four miles, pedaling to work would have a dramatic effect on air quality.

Both city and country dwellers are endangered in other ways by the automobile. Some 100,000 people in North America, Western Europe, Japan and Australia died in traffic accidents in 1985. Developing countries--with fewer automobiles but more pedestrian traffic and no provisions for separating the two--have fatality rates as much as twenty times higher than industrial countries.

Bicycle riding is not without its risks. Bicycle accidents do account for many traffic injuries, particularly in Asia, but are unlikely to kill people unless motor vehicles are involved. But that is small consolation for would-be bicyclists who are intimidated off the road.

Latin America has its urban cyclists--including young boys delivering newspapers and craftspeople hauling goods--but many potential riders are deterred by dangerous traffic conditions. Nairobi streets that once were full of bicycles now are only safe for cars.

Where it can be done safely, cycling improves public health. The popularity of stationary exercise bikes is proof that people enjoy cycling to keep fit; the irony is that so many people drive to the health club in order to ride them. Cyclists are less vulnerable to heart attacks or coronary disease than sedentary commuters, and they arrive at work more alert and less stressed by rush-hour traffic.

## An Equitable Technology

Bicycles have a hard time getting the respect they deserve, even in countries where they give crucial mobility and employment to millions. The city of Jakarta, Indonesia, for example, has confiscated tens of thousands of cycle rickshaws over the past several years and dumped them into the sea in order to "reduce traffic congestion." Last year more than 100,000 pedicab drivers in Dacca, Bangladesh faced a potential ban of their pedal-powered cabs for safety reasons.

Public buses are the main mode of transport in most developing countries and often the only one poor people can afford. But transit systems have proved incapable of keeping pace with explosive urban growth rates.

Even where mass transit systems are adequate, they do not serve certain crucial needs. A passenger bus cannot haul a Ghanaian farmer's produce to market, or carry a Colombo street vendor's hot lunches to a factory. Nor can it help rural people who live a day's walk from the nearest road. With bicycles, the poor and unemployed can earn a living by getting homemade crafts to urban markets, vending wares in the streets, or taking passengers for hire.

A bicycle demands a tiny fraction of the capital necessary to own and operate an automobile. In Brazil, the least expensive domestic car costs an average worker roughly six years' wages, while a bicycle requires nearly six weeks' pay.

Though many of those who would most benefit by a bicycle are too poor to own one, the bicycle is still the cheapest mode of transport outside urban cores. Governments could encompass rural areas in their transport planning by subsidizing bike purchases, a much less costly approach than extending roads and bus lines. In addition, bicycle production is a low-risk venture for developing countries that have little or no industrial base.

A small assembly plant and repair shop can run on about $200 worth of tools. One hundred bicycles can be manufactured for the materials it takes to build a medium-sized car.

India has demonstrated how a nearly self-sufficient bicycle industry can be created by first assembling bicycles with imported parts, then producing frames in local workshops and gradually establishing small factories to produce parts domestically. From a modest beginning five decades ago, India has become a major world producer, second only to China. It directs more than ninety percent of its bicycle exports to other developing countries, and through joint-venture and license agreements is sharing its small-scale, labor-intensive techniques with countries throughout Asia, Africa, and the Caribbean.

## Subsidized Auto Dependency

The economic and environmental consequences of automobile overdependence may eventually necessitate bicycle use, even without government help. But for now, public policies that ignore bicycles perpetuate private attitudes against using them. Thus, the transport planner's office seems the best place for the philosophical reordering to start.

A major barrier to bicycling is the fact that drivers are in effect paid to use automobiles. Drivers in the United States may receive as much as $300 billion in subsidies each year

*Bike lanes in Tokyo, Japan are separated from traffic lanes by planters.*

in the form of public funds to pay for road repair and construction, police and fire services, and health care.

In the private sector, free parking provided by many employers in effect pays the gasoline costs of commuting. The U.S. Environmental Protection Agency has concluded that if employees were directly handed this subsidy, public transit ridership and bicycle use would go up, while auto traffic would decline by twenty-five percent.

Several cities have made motorists pay for the privilege of driving automobiles. Singapore charges private cars carrying fewer than four occupants "congestion fees" for entering the downtown area during rush hours, a decade-old scheme that has raised downtown traffic speeds by twenty percent and reduced traffic accidents by twenty-five percent.

Inconvenience--a general absence of safe parking and locker room facilities--keeps many commuters from bicycling to work, but there are precedents for dealing with this. In China, bicycle parking lots are guarded against theft by attendants. Palo Alto, California has successfully passed a number of innovative regulations requiring builders of large offices to provide showers and bicycle parking.

**Table 3. Production of Bicycles and Automobiles, Selected Countries, 1987 (In Millions)**

| Country | Bicycles | Automobiles |
|---|---|---|
| China | 41.0 | .00[1] |
| Taiwan | 9.9 | .20 |
| Japan | 7.8 | 7.89 |
| U.S. | 5.8 | 7.10 |
| USSR | 5.4[2] | 1.33 |
| India | 5.3 | .15 |
| W. Germany | 2.9 | 4.37 |
| South Korea | 2.6 | .79 |
| Brazil | 2.5 | .68 |
| Italy | 1.6 | 1.71 |
| Poland | 1.3 | .30 |
| U.K. | 1.2 | 1.14 |
| Canada | 1.2 | .81 |
| Others | 10.5 | 6.54 |
| World Total | 99.0 | 33.01 |

*Sources*: Worldwatch Institute, based on Motor Vehicle Manufacturers Association, *Facts and Figures '89* (Detroit, Mich.: 1989); *Japan Cycle Press*, various editions; and other sources.

[1] In 1987, China produced 4,045 automobiles.
[2] 1986 estimate.

All that aside, commuters are still not likely to choose bicycling when it means taking their lives into their hands on busy city streets. In some situations, effective bicycle promotion calls for bike paths separate from roads and space on regular roadways devoted to bicycles. More importantly, though, traffic management and driver training should reflect bicycles' role as legitimate vehicles. Along with public education campaigns on safe bicycling, these steps can elevate bicycling to the status of real transportation in the public's mind.

## Pedaling Into the Future

In terms of sheer number of vehicles, the world is well-equipped to let bicycles take on a larger share of the transportation burden. Around the world, nearly 100 million bicycles are made each year--three times the number of automobiles (see Table 3). The big bicycle producers, especially in Asia, are sure to keep upping their capacities.

With or without bike-oriented planning, financial imperatives may force a shift to the bicycle. For starters, most people in the world will never be able to buy an automobile, and public transit systems in many cities cannot keep pace with explosive population growth. When the next oil crunch hits, perhaps within the next decade, even those who can now afford to drive will be looking for alternatives. With relatively modest public investment in parking and road space for bicycles, transportation choices would multiply quickly.

Environmental degradation may also change planners' thinking. The by-products of fossil fuel combustion--deadly urban air pollution, acid rain on lakes and forests, and global warming--as well as the paving of valuable land, point to the need for an alternative to engines. The bicycle is the only vehicle that can help address all of these problems and still provide convenient and affordable personal transportation.

While transport planners remain fixated on the auto, congestion and commuting costs are already spurring people to switch to bicycling. The number of bicycle commuters in the United States reached 2.7 million in 1988, which is still less than 3 percent of all commuters, but represents more than a quadrupling in one decade. This happened with virtually no public policy push, suggesting that official encouragement could inspire a more dramatic changeover.

Just how rapidly the bicycle will expand transport options, check environmental damage, and restore urban quality of life depends on how quickly it moves from individual preference onto the public agenda.

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## Solid Waste Resource Center Offers Timely Information

The Solid Waste Resource Center, located in Asheville, N.C., is a new information clearinghouse for solid waste planning. The Center was established by the Land of Sky Regional Council, through a grant from the Tennessee Valley Authority, in response to the growing needs of local governments, development districts, and others who need timely information on all aspects of solid waste management.

The council maintains a solid waste library, and a weight and composition database developed during one and one-half years of field work with member communities in North Carolina's Region B planning area. The Center provides a means for the Council to share its experience and knowledge with others inside and outside the region.

To use the Resource Center, write or call with your request or question. Council staff will provide consultation over the phone to narrow down requests, and will help you find the information you need, or refer you to the appropriate resources. Staff consultation and library use are free. Charges are made only for actual cost of printed materials, or database searches.

The Center maintains a large collection of periodicals and also has some videos on selected topics. A resource list is available free of charge from the Land of Sky Council. This list is updated twice a year, as new materials are received. The current list of topics covered by the library includes:

- General Solid Waste Management
- Education and Public Involvement
- Weight and Composition Studies
- Pollution Prevention Pays
- Incineration and Waste-to-Energy
- Household Hazardous Wastes
- Used Oil and Tires
- Recycling
- Landfilling
- Composting

The model solid waste planning process developed out of this experience is outlined in the recently published *Solid Waste Planning Manual.* For more information, contact Robin Sexton at the following address: Solid Waste Resource Center, Land of Sky Regional Council, 25 Heritage Drive, Asheville, North Carolina 28806, (704) 254-8131.

# Sustainable Transportation For Developing Countries

**Ken Hughes**
**Michael Replogle**

*A quiet revolution is underway to resurrect and reinvigorate human powered forms of transportation. This article describes the birth of a bicycle culture in El Salvador, the involvement of the American group Bikes Not Bombs, and concludes with a discussion of sustainable transportation strategies.*

*Like thousands of others in Jakarta, Ahmad lost his livelihood, his savings, and his home when the government seized and threw into the sea his becak, a three-wheeled cycle rickshaw, which he drove during the day and slept in at night. Ahmad fell victim to a law banning becaks from Jakarta, adopted because Indonesia's elite sees pedal-powered vehicles as backward and holds them responsible for traffic congestion. Today, Ahmad pays bribes to skirt the law, rents another man's becak, and earns less than he did before, dodging insults and traffic, waiting for fares. Like hundreds of millions around the world, Ahmad is being ground into the dust beneath the fast moving wheels of motorization.*

Just as unsustainable natural resource policies have destroyed the diversity of ecosystems in many parts of the world, so too are unsustainable transportation policies destroying the balance between high-cost motorized and low-cost non-motorized transportation modes. Rapidly increasing global motorization is retarding development for the majority of Third World people. Wrong-headed transportation strategies are a leading cause of the dangerous mountain of debt accumulated by Third World nations and the growing environmental problems that now threaten global changes in climate.

The dream of an automotive society is simply well beyond the means of most of the world. There is not enough petroleum, capital, and infrastructure around for this to be a near-term global goal. Motorization is a pleasure attainable only by a small minority of the world's people.

Yet many of the world's transportation decision makers subscribe to the common perception that "motorization equals modernization" and spend staggering amounts of scarce foreign currency earnings for their transportation systems. El Salvador, Haiti, Kenya, and Thailand are just a few of many countries that spend a third to half of their foreign exchange earnings to import petroleum and motor vehicles. Nevertheless, out of every one thousand people, less than four are car owners in Mozambique and India; less than five in Haiti, Pakistan, El Salvador, and Indonesia; less than seven in Bolivia, Zaire, and Honduras; and less than fourteen in Liberia and Thailand. In Brazil and Mexico sixty out of one thousand own cars, compared to three hundred in Europe and five hundred in the United States. The budding "automobile cultures" in these countries leave the poor walking and mortgage the future of these countries for current gasoline consumption by the small middle and upper classes.

While motorization is occurring in many parts of the developing world, traditional, non-motorized, and low-cost transportation modes, such as bicycles, carts, trishaws, small locally produced boats, and ox carts, generally are ignored or dismissed without study as backward and inefficient. Little data are collected about these modes, reinforcing the impression among transportation professionals that these modes are of little consequence. The most basic mode, walking, is similarly neglected as an area of serious inquiry.

Yet a quiet revolution is underway in many places to resurrect and reinvigorate these human-powered forms of transportation. Among the signs of change in thinking are the birth of a bicycle "culture" in El Salvador, the beginning of a bicycle industry in Nicaragua, and new thinking about transportation strategies at the project level in the Sub-Saharan Africa region of the World Bank.

## The Salvadorean Experience

The Salvadorean Center for Appropriate Technology (CESTA) has laid the groundwork for moving away from

the motorizing framework of the Salvadorean society. CESTA is taking intelligent steps to change thinking, through examples of the right blend of cycle technology and credit access, to make possible a bicycle "culture," which exists only in the developing world of Asia.

Ricardo Navarro, head of CESTA, spent many years in the United States and Europe studying and practicing appropriate transportation technology. Upon his return to El Salvador, he surveyed workers in San Salvador for their preference among seven different kinds of bicycles to use on a daily basis for commuting and hauling goods. An all-terrain bicycle design, the most popular type of bicycle in the United States, was unanimously chosen. It offers the potential for widespread application in the Third World. The all-terrain bicycle's strength (from new alloys), stability (from wide handle bars), and traction (from "balloon" tires) make it ideal for rough Third World conditions.

Most of the workers in San Salvador indicated that they would be willing to spend up to $250 if they could get credit and pay off the purchase over a two year period. This would mean monthly payments of an amount equivalent to bus fare. With $400,000 in start-up grants, CESTA is beginning a domestic bicycle assembly industry in El Salvador to meet this market need.

CESTA is also designing new lightweight carts which are intended for introduction to those carrying heavy loads. This is crucial for people whose caloric intake and hard living conditions make movement of loads by foot particularly onerous.

## Rural Applications

Rural productivity can be greatly improved with such tools. In many parts of the world, people spend hours each day carrying fuel, water, and produce over significant distances unaided by carrying devices or simple vehicles. The most practical way to do this is to carry things on one's head, a practice known as "head-loading." Thampil Pankaj, a World Bank economist, recently noted that "the head-loading and foot-path economy not only constrains production and marketing, but also limits other forms of rural mobility and access to schools and health facilities, severely affecting the development of human capital and the quality of life. Extensive head-loading also causes a severe health problem (cervical spondylosis) due to constant trauma to the neck and spine and remains the most burdensome chore affecting the rural woman's life...Head porterage effectively limits the time and energy available for farm activities, particularly because the peak of transport activity coincides with the peak of farming activity in the harvest season."

To solve this problem, the World Bank is supporting a pilot project in northern Ghana to build low cost "single blade" roads at eight percent of the cost of conventional feeder roads. The pilot project will also provide low-cost non-motorized vehicles such as bicycle trailers and hand-propelled farm carts to villages served by these new cart tracks. The World Bank has also agreed to fund slow moving traffic lanes in two urban rehabilitation roadway projects in Mozambique.

## Bikes Not Bombs

The transportation crisis in Nicaragua, coupled with Swiss, Dutch, and American technical and humanitarian assistance, has fostered a huge growth in both supply and demand for bicycles. Since 1984, the American group Bikes Not Bombs (BNB) has sent over 3,000 recycled bicycles, tools, and parts, with a combined total value of over $350,000, for distribution to Nicaraguan workers in health, education, and production. BNB is a project of the Washington, DC based Institute for Transportation and Development Policy.

The BNB campaign is an international solidarity and assistance project formed with the purpose of sending donated and recycled bicycles, parts, tools, and technical help for the development of a bicycle infrastructure in Nicaragua. Sturdy, used bicycles are collected in over twenty-five towns and cities in the United States, Canada, and Europe. The bicycles are sent to the bicycle mechanic training and assembly workshops established with the assistance of BNB and other European and American soli-

*These two Nicaraguan workers reduced their round-trip travel time from three days on foot to just one-half day after receiving bicycles from Bikes Not Bombs.*

*Bike mechanic, Managua, Nicaragua*

darity groups in Managua and Leon. The staff of the shops consist of several full-time foreign project coordinators and mechanic trainers, many short-term volunteers, and nearly two dozen Nicaraguan salaried employees. The Leon workshop, organized with a group of disabled veterans, also manufactures wheelchairs.

In Nicaragua, BNB works with the Ministry of Transportation, various non-governmental organizations and numerous Nicaraguan organizations and labor unions to ensure effective distribution of the bicycles at subsidized low costs. The donated bicycles undergo complete overhaul and reconditioning at the BNB workshop. The Nicaraguan BNB workshop charges recipient organizations a modest assembly fee for each bicycle to cover the cost of Nicaraguan salaries, shop overhead, and bicycle project development in Nicaragua. International staff stipends are paid for by the Institute for Transportation and Development Policy and other American solidarity groups.

Following the model established by CESTA's Ricardo Navarro, and the Swiss-Nicaraguan group Sofonias, BNB is working cooperatively with Dutch, Swiss, and Nicaraguan groups to help establish a bicycle assembly industry in Nicaragua. Shipments of recycled, sturdy, used bicycles from the United States and elsewhere to Nicaragua are being stepped up to respond to the near-collapse of the Nicaraguan economy and transportation systems.

In the United States an important aspect of BNB is its political and educational outreach work. BNB promotes solutions to the current conflicts in Central America and American foreign policy that respects the rights of all people to guide and determine their own development. BNB national and local coordinators have come together through cycling, environmental, religious, civic, and Central American solidarity organizations, bringing newcomers into the movement who promote negotiated settlements of conflict in Central America and an end to United States military and economic warfare in the region.

BNB hopes to respond to growing requests for on-site repair classes in urban work centers and rural cooperatives so they can maintain their own bike fleets, with BNB providing initial parts, tools, and technical training. BNB also promotes urban planning for sustainable transportation development in Nicaragua, in light of the expected long-term shortages of capital for petroleum imports and the need for non-motorized transportation.

Any country can start a bicycle industry, but it must start small and assemble imported bicycles. Only gradually should a country substitute imports with "home-grown" frames and parts. The Institute for Transportation and Development Policy is working to emulate the Nicaraguan and Salvadoran models of indigenous bicycle industry development in two other countries: Haiti and Mozambique. Models to be avoided include Tanzania's large-scale, tariff-protected bicycle industry. Brazilian and Taiwanese export-oriented bicycle industries offer models for large-scale bicycle production in the context of heavily industrializing economies with substantial available capital investment.

## Sustainable Transportation: Concepts and Technical Options

In the broader sense, these projects are linked to a global challenge to promote and implement sustainable transportation options. There is hope for the mobility of the poor, particularly with the emergence of "sustainable development," a concept drawing much attention currently in the development community. Sustainable transportation calls for a more holistic approach to transportation policy and investment planning with emphasis on achieving a diverse and balanced mix of non-motorized and motorized transport modes; more attention to unmet local mobility needs of low-income people; and more awareness of the impacts of transportation systems on environmental quality and resource utilization. Sustainable transportation strategies

*Ambulance workers receive bicycles from Bikes Not Bombs at the BNB Managua workshop, Nicaragua.*

are those that can meet the basic mobility needs of all and be sustained into the foreseeable future without environmental destruction.

For short-distance movement of people and goods, low-cost, non-motorized transport modes powered by renewable energy sources are the natural complement to motorized public transport modes. Public transport modes best provide movement in corridors with moderate to high-volume flows and moderate to long trip lengths. By facilitating the use of different modes to meet diverse travel demands, the transport system can be optimized to yield broadly distributed benefits at minimal societal costs.

Major global lending organizations, like the World Bank and U.S. AID, however, have done little to encourage such diversity in transport system development. The World Bank, for example, wrote a 400-page report on the transport sector in China that did not include even the word "bicycle," although more than 270 million bicycles are the main means of urban and rural mobility in China. The World Bank's recently reissued Urban Transport Policy paper ignores non-motorized transport, except to note that it causes traffic congestion. Most World Bank lending aids motorized transport. Pressures of the global debt and environmental problems are leading some officials of the World Bank, however, to rethink priorities for transportation lending, with greater recognition of the vital role played by truly low cost transport modes.

The Institute for Transportation and Development Policy has been lobbying Washington for more attention to non-motorized and low-cost transportation modes in development programs. As part of last year's foreign-aid package, Congress indicated its interest in seeing such a change in policy. Nevertheless, further legislation is needed. The "Human Needs and Mobility Joint Resolution" and the global warming bill sponsored by Representative Claudine Schneider (Republican, Rhode Island) would both direct appropriate changes in the World Bank and American transportation development assistance programs.

## Sustainable Transportation Strategies

### *Assess Alternatives*

Impact statements should be required for all transportation projects funded by the World Bank and other development lending institutions. These statements would identify alternatives to the proposed project and anticipated impacts on (1) the environment, (2) other transportation modes, (3) the poor, and (4) long-term foreign currency requirements. Structural adjustment programs should include changes in transportation spending priorities to ensure economic and environmental sustainability.

*Enhance Access to Tools for Mobility*

Programs should be developed to enhance poor people's access to low-cost vehicles and efficient carrying devices. Such tools increase the labor productivity of the poor and their access to services and local markets.

*Provide Access to Credit in Small Amounts*

The provision of low-cost credit to the poor to buy bicycles, carts, pack animals, and similar vehicles, should be a high priority to ensure that the poor have access to affordable mobility. In Hyderabad, India, commercial banks were encouraged to lend to rickshaw operators for the purchase of vehicles. And in the Dominican Republic, a credit union of tricycle drivers helps finance vehicle purchases and assembly projects.

*Produce Low-Cost Vehicles Locally*

The development of local bicycle assembly and cart production capabilities for domestic use should be encouraged. By starting with small, low-capital-cost assembly workshops, countries with little or no industrial base can begin to develop appropriate domestic transportation vehicle manufacturing capabilities at little risk.

*Bikes Not Bombs bikeathon in Boston, Massachusetts*

*Emphasize Infrastructure Needs*

Transportation investment policies should place more emphasis on roads and trails suitable for low-cost vehicles.

*Mix Land Uses*

Urban land use planning needs to move towards mixed land use patterns. Greater decentralization of employment can reduce the need for motorized commuting as well as encourage greater community integration. Growing cities should locate employment clusters and affordable housing in corridors well served by rail or bus transportation.

*Restrict Auto Use*

The automobile should be subject to far greater restrictions in dense central city areas. Area licensing schemes, successful in Singapore, should be more widely adopted along with more widespread automobile free zones.

*Eliminate Subsidies for the Automobile*

Taxes on automobile purchases and operation, particularly for private use, should be sharply increased to reflect the true costs of automobile use on the environment. Subsidies for automobile use of urban road space should be eliminated. Taxes on bicycles, public transportation vehicles, and non-motorized vehicles should be lifted or drastically reduced.

*Amend Road Construction Standards*

Road construction standards should be reduced and more labor-intensive lighter weight motorized and non-motorized vehicles should be favored over heavy weight vehicles. Exceptions to this would be for certain types of raw material and bulk commodities transport on selected routes. In some cases this traffic might be well served by rail. These strategies can create jobs and substantially reduce the costs of roads.

*Redistribute Land*

The development of new roads should be accompanied by land redistribution and secure land tenure to those living near the new roads. Otherwise, most benefits of the new roads will accrue to the landowners or those with the capital to take advantage of increased market access.

*Educate the Public*

Diverse programs and actions should be undertaken to influence public opinion in favor of less resource intensive transportation modes. Moreover, traffic discipline and safety should be promoted in the operation of both motorized and non-motorized modes.

*Reassess Transport and Development Priorities*

Rural extension agents should be afforded bicycles to enhance their productivity at low cost and to counter low-status associations that human-powered modes have in many countries. For the same cost of sending one jeep to

the front office of a development project, a whole fleet of all-terrain bicycles and carts can be sent to provide mobility to project participants, organizers, and agents.

*Broaden Professional Education*

Transportation professionals at all levels should be encouraged to consider non-motorized and informal modes of transport seriously when collecting and analyzing data; when designing facilities and policies; and when evaluating alternative solutions to mobility problems. Textbooks designed for traffic planning in the highly motorized and affluent United States are inappropriate for India, Mexico, or China.

*Increase Funding for Research and Development*

Funding for research on transportation problems in developing countries should be increased and a South-South technology transfer encouraged. Relatively small investments could produce significant improvements in traditional carrying devices and vehicles powered by humans, animals, wind, and sun, extending their range and utility at low cost. Funding is needed to support demonstration projects for the transfer of emergent low-cost technologies.

*Build Institutions and Invite Community Participation*

Technological research and training centers should study and respond to local needs and build community leadership and skills. Transportation projects should be designed in consultation with representatives of the poor and the users of slow transportation modes to identify alternative strategies for mobility enhancement; unmet travel needs; and ways of making projects most compatible with the interests of all potential users.

## Conclusion

Most developing countries must look to each other for their models of development, not to the rich countries of the North, where high-capital and energy-intensive technologies have often displaced more sustainable low-cost and renewable-energy-powered technologies. Africa and Latin America have much to learn from Asia, where human-powered transport plays a vital economic role. In contrast the United States, with its dangerous dependence on the automobile, is a poor role model for transportation policy. Even at high levels of development, modernization does not need to imply full motorization, as demonstrated by many healthy and wealthy Dutch, Swiss, and Japanese communities.

Changes in development and transportation policies and programs are needed not only in the Third World, but also in many advanced industrial and post-industrial countries, if development is to meet the needs of more than just the world's elite. The costs of failing to redirect transportion policies today will be paid in the decades to come through a sharply reduced quality of life in the world's cities; increased conflict between the mobile elite and the mobility-restricted poor; and reduced capacity for the global system to deal with the emerging problems of fuel, capital shortages, and atmospheric carbon dioxide build-up. The time for changes in policy is now.

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*Sustainable transportation strategies provide for basic mobility needs.*

# Planning for Endangered Species: On the Possibilities of Sharing a Small Planet

**Timothy Beatley**

*Increasingly in the United States, the preservation of endangered species and biological diversity conflicts with the mounting pressures of urban growth and development. Here, Timothy Beatley presents several arguments on the importance of species protection. He discusses the case of the endangered fringe-toed lizard of the Coachella Valley, California to illustrate the practical problems of habitat conservation that arise from competing land-use interests. Beatley asserts that planners can play a vital role in directing strategies to protect crucial habitats.*

## Species Protection as an Urban Planning Problem

Forty years ago, in his now famous *A Sand County Almanac* (1949), Aldo Leopold talked of the need to embrace a new and different ethical posture towards the natural environment. Human beings must move from the position of conquerors of the environment to one of being "plain citizens" of it. To Leopold, we are but equal members of a complex and interconnected network of life. It is time to resuscitate his vision in light of the tremendous environmental damages being inflicted on our planet, and on the other inhabitants of it. It is precisely those "other" inhabitants that I wish to focus on here.

It is my contention that as planners, we must squarely face up to our obligations to protect other species from the wholesale destruction we would otherwise subject them to. Moreover, this is increasingly within the practical policy domain of urban planning, in that many contemporary species conflicts revolve around disputes between land development and protection of species habitat. A number of specific development-species conflicts are employed as examples below. I will suggest that as "plain citizens," we have a strong moral obligation to reevaluate the ways in which our urban settlements grow and develop. Planners must lead the charge.

There is an unfortunate tendency on the part of many, perhaps most, Americans to view the problem of species loss primarily as a problem occurring somewhere else. People are most readily able to conjure up images of the black rhino or mountain gorilla when they think about endangered species; species that are obviously not indigenous to the United States. Even American-based campaigns seem to focus primarily on these popularly recognizable endangered species. It is interesting that the recent joint venture of Wendy's restaurants and the World Wildlife Fund (selling stuffed animals, with a percentage of the profits going to World Wildlife Fund projects) placed attention on species such as the snow leopard and the panda, rather than the Florida panther, black-footed ferret, or other American endangered species. The unfortunate fact is that dramatic species loss is an American problem, not simply a problem relegated to distant tropical rainforests essentially beyond our control. It is clearly a problem in our own backyards. There are some five hundred plant and animal species in the United States that are listed as endangered or threatened under the federal Endangered Species Act (ESA), and several thousand additional species listed as candidates, many of which will soon be listed as endangered or threatened.[1] Thus, the number of endangered species in the United States has been dramatically on the rise.

Increasingly in this country, the preservation of endangered species and biological diversity is bumping directly up against pressures for urban growth and development. The examples of development/species conflicts are numerous. A recent proposal to build a shopping center in Austin, Texas threatens the survival of five cave-dwelling invertebrates found nowhere else in the world (a spider, two types of beetles, a pseudo-scorpion and a cave-adapted daddy longlegs). New housing projects in western Riverside County, California, threaten the habitat of the endangered Stephens' kangaroo rat. Second home development on Big Pine Key, Florida, threatens the existence of the dwindling population of the key deer, which, among other things, has fallen victim to road-kills as a result of the dramatic increases in automobile traffic accompanying new development. Endangered sea turtles all along the Atlantic and Gulf coasts have difficulty nesting because of

the explosive shoreline development and the bright lights typically associated with it. The least Bell's vireo, a western songbird, is threatened in the San Diego area as a result of development in, and destruction of, its riparian habitats. A recent study by the Center for Plant Conservation indicates that urban development is threatening hundreds of native American plants (Shabecoff, 1988). Neither planning theory nor practice have adequately taken this issue into consideration.

American planners have the opportunity, and indeed the responsibility, to provide strong and positive leadership in the area of species protection. Indeed, their leadership could set standards for protecting and conserving species worldwide. By global standards, the United States is a prosperous and wealthy nation and, in theory, ought to be able to effectively protect from extinction those species within its control. The United States carries an important responsibility as an international model for conservation as well as economic prosperity. It is difficult for leaders in developing nations to effectively argue for the importance of protecting endangered species when many such U.S. efforts appear to be marginal and undervalued. In this country, the conflict is usually not one of deciding between providing basic food and housing and protecting species and their habitat. Rather, the conflicts are more often between species and the provision of luxury second home housing, or the exploitation of natural resources and habitat where substantial alternatives exist.

The U.S. examples that have been offered, however, may be of the wrong sort. Several recent examples of resolutions to development-species conflicts are discussed below; particular emphasis is placed upon one case that has been recently offered as a successful model. I will question this model, highlight the basic obstacles to species protection illustrated by this example, and offer suggestions for a new vision. Before doing so, however, it is helpful to briefly explore the rationales typically offered for protecting species.

*In the United States, the conflict is usually not one of deciding between providing basic food and housing and protecting species and their habitat.*

## The Importance of Protecting Species

There are many selfish reasons for protecting endangered plant and animal species. It is estimated that the total number of species in the world number from five to thirty-million (of this there is even considerable uncertainty; see Wilson, 1988). Each represents a tremendous biological storehouse, the loss of which may deprive us of substantial medical, scientific, and commercial benefits. We are now in the position of losing many species we have yet to even fully catalog or understand. A large portion of commercial pharmaceutical products are derived directly from wild plants and animals, and potential scientific and medical benefits are tremendous. (see Meyers, 1979). Protecting

species diversity may also hold out the potential of discovering new disease-resistant crops, or crops better adjusted to changing climatic conditions (e.g., the Buffalo gourd). For instance, a plant native to Central Africa (kenaf) is currently thought to be a much cheaper and less environmentally harmful source of pulp and paper fibers than trees (see Brody, 1988).

Endangered and threatened species are also important indicators of how healthy and sustainable our planet really is. The loss of the least Bell's vireo, or other songbirds, may hold little direct impact to most people, yet may be indicative of the occurrence of broader environmental degradation and a harbinger of more severe environmental calamities to come. Biologists Paul and Anne Ehrlich use the vivid analogy of rivets popping out of the wing of an airplane to describe species extinction (see Ehrlich and Ehrlich, 1981). With each popped rivet (loss of a species), the structural integrity of the airplane (earth) is further undermined, until reaching a point where the plane will no longer fly.

Moreover, we simply do not understand the intricate ways in which the loss of a single species will affect other species and, in turn, human beings. A basic and undeniable environmental axiom is that everything is connected to everything else. While there is considerable truth to this line of argument, it is often difficult, at least in the short run, to discern any dramatic impacts of species extinction. It may take many years to detect the ripple effects to humans of the loss of, say, the spotted owl in the west and northwest United States. It often appears easier to argue that the loss of the habitat, rather than the species, may be of greatest consequence (e.g., advocating the preservation of Brazilian rainforests because they impact global climate and oxygen levels, rather than because they serve as habitat for, say, the endangered golden-lion tamarin).

There are also fairly convincing arguments that endangered species and their habitats provide or could provide substantial recreational and aesthetic benefits for humans. This is undoubtedly true, as is apparent to anyone who has witnessed the flight of a peregrine falcon or the fishing behavior of a grizzly bear. Even those species less "cuddly" in their appearance hold substantial recreational and visual benefits. The behavior and life processes of invertebrates would offer to many a "fascination value," to use the Ehrlichs' terms (see Ehrlich and Ehrlich, 1981). One can envision a time in which people might refocus their curiosity and sense of intrigue away from dime store novels and steamy television shows and toward the many other forms of life inhabiting our planet.

A somewhat more compelling, though still anthropocentric (i.e., human-centered) line of argument, lies in the fundamental importance of other creatures in a deeper emotional sense. It seems that as a species we must value the existence and qualities of other forms of life--one needs only to casually look at the names we give to automobiles and other product lines; the images we use in advertising and business affairs; and the animal symbols we employ to represent important societal and governmental institutions. What strikes me is the understated importance of "otherness"; that is, the knowledge that we are not alone on the planet, but rather part of a larger constellation of life forms. The quality of my life is enhanced significantly by the knowledge that such creatures as the desert tortoise exist, even if I have few direct opportunities to see the species in the wild. Whether we admit it or not, the loss of each species diminishes our lives in important ways. The prospect of an increasingly empty planet in terms of the number and diversity of species is a depressing one. Species extinction represents innumerable lost opportunities for human enrichment. In an 1855 letter to Franklin Pierce, chief Sealth of the Duwamish tribe of Washington State stated the point nicely: "If all the beasts were gone, men would die of great loneliness of spirit" (Nobokov, 1978, p. 109).

While these arguments are convincing in their own right, there seems to be an even more fundamental issue here. These contentions, while containing considerable validity, are unnecessarily anthropocentric and utilitarian in their focus. Need one justify allowing a species to exist simply because it holds some instrumental value or benefit to humans? This attitude, I believe, epitomizes our arrogance as a species (what some have called "speciesism") and fails to perceive the intrinsic value of other forms of life. I agree with David Erhenfield's "Noah Principle," which holds that species have a basic right to exist: "they should be conserved because they exist and because this existence is itself but the present expression of a continued historical process of immense antiquity and majesty. Long-standing existence in nature is deemed to carry with it the unimpeachable right to continued existence" (1978, pp. 207-208).

Other environmental ethicists have sought to refine and expand this basic notion. Paul Taylor's theory of "Respect for Nature," for example, is one of the more philosophically sophisticated (see Taylor, 1986). His ethic of respect for other forms of life is grounded on a "biocentric outlook," consisting of several key beliefs, among them: that humans are but members of the "Earth's community of life"; that human and non-human species are "integrated elements in a system of interdependence"; that all organisms are "teleological centers of life," with each representing a "unique individual pursuing its own good in its own way"; and that humans "are not inherently superior to other living things" (Taylor, 1986, pp. 99-100). These beliefs, Taylor argues, lead to an ethic of respect for other forms of life, not because they hold value or benefit for humans, but because they have inherent worth and a good of their own.[2]

What emerges is a view of man as a "co-inhabitor" of earth: a "plain citizen," to again use Leopold's terms. This, in turn, suggests a new and different attitude towards other

species and a solemn duty to minimize, to the extent possible, man's species-threatening impacts. Such a view is not an easy one for planners and policymakers to implement, as the case examples and discussion below will indicate.

## The Realities of Species Protection

As compelling as arguments to protect endangered species might be in the abstract, the realities of such protective programs in the field suggest a number of practical and political difficulties. Conflicts between species conservation and urban development typically involve different community factions with different perspectives on what constitutes fair and reasonable results. Even when there is agreement about the need to protect an endangered species, there is often considerable disagreement about how it should be done. If planners are to be effective at promoting species conservation, they should be ready and able to foresee these practical obstacles and to respond to them.

To illustrate these practical realities, it will be useful to focus attention on a specific development-species conflict and its eventual resolution. I obtained substantial insight into the case through interviews with key participants in this dispute.[3]

The recent conflict upon which I will focus, which occurred in Coachella Valley, California, illustrates many of the points I wish to make. Coachella Valley, located about one hundred miles east of Los Angeles, is home to nine rapidly-growing cities, including Palm Springs. It is also home to the Coachella Valley fringe-toed lizard, placed on the federal endangered species list in 1980 after tremendous reductions in its habitat and range (See U.S. Fish and Wildlife Service, 1985). Its habitat formerly extended throughout the Valley, but in recent years it has had to compete for limited land area with booming country club and resort development. The lizard represents the quintessential example of evolutionary adaptation. It lives in blowsand habitat and has developed distinctive morphological features in response. The most notable features are the fringe toes--a row of elongated scales on the edge of the toe which provides extra traction and allows the lizard to "skate" along the sand (and under it) at high speeds. Other blowsand adaptations include a wedged-shaped snout which facilitates diving into the sand; fringed eyelids; a loose flap of skin which covers the lizard's ear while diving in the sand; and the ability to partially close its nostrils, also to prevent the entrance of sand.

In 1983, the conflict between the preservation of the lizard and development pressures came to a head when local environmentalists objected to the proposed Palm Valley Country Club--a project that was to consume more than four hundred acres of habitat. To opponents, the project was clearly illegal under the federal Endangered Species Act (ESA), which prohibits the killing or harming of a listed species. For their part, the developers seemed poised for a protracted legal and political battle, even threatening to seek changes to ESA should the U.S. Fish and Wildlife Service attempt to shut down development in the Valley. It was agreed that a Habitat Conservation Plan (HCP) should be prepared. Under the 1982 amendments to ESA, the U.S. Fish and Wildlife Service can issue an "incidental take" (Section 10(a)) permit when it can be shown that through the implementation of an HCP a species' chances of survival and recovery will not be diminished. The plan was prepared by a steering committee consisting of representatives of the major groups involved,

*The endangered fringe-toed lizard of the Coachella Valley is threatened by the reduction in its blowsand habitat due to development pressures.*

including the ten local jurisdictions (nine cities and Riverside County), the development and environmental communities, U.S. Fish and Wildlife Service (FWS), California Department of Fish and Game, and the Bureau of Land Management. The group was chaired by the Nature Conservancy and much of the technical work was done by consultants (see Coachella Valley Steering Committee, 1985).

The solution proposed by the plan, and ultimately implemented, was to establish three separate fringe-toed lizard preserves, the largest comprising an area of approximately thirteen thousand acres. The Nature Conservancy acted as the project coordinator and land acquisition agent. The total cost of establishing the preserves was approximately $25 million, to be obtained from a variety of sources, including some $7 million from developer mitigation fees. All developers of land lying within a designated mitigation zone (the historic range of the lizard) are required to pay a fee of $600 per acre, until $7 million is accumulated, after which the mitigation fee will drop to $100 per acre. As Table 1 indicates, large sums have also come from the Federal Bureau of Land Management in the form of land swaps, and from the federal Land and Water Conservation Fund. As these funds have become available, the Nature Conservancy has repaid itself for its initial acquisition costs.

**Table 1. Projected Funding Sources for Coachella Valley Fringe-Toed Lizard Preserves (In Millions)**

| Funding Source | Amount |
|---|---|
| Federal Land and Water Conservation Funds | $10.0 |
| BLM land exchange (cash value) | 5.0 |
| State Wildlife Conservation Board | 1.0 |
| Nature Conservancy | 2.0 |
| Developer Mitigation Fees. | 7.0 |
| Total | $25.0 |

*Source: Coachella Valley Fringe-Toed Lizard Habitat Conservation Plan*, June 1985

While the FWS has approved the HCP, and has issued a Section 10(a) incidental take permit, there is anything but universal consensus that the lizard's long term survival is assured. To most, even in the environmental community, this is a calculated risk, but a better outcome than one generated through confrontation. From the developers' perspective, the FWS permit has opened up the remaining areas of the valley for development and relieved any need to be concerned about the lizard's fate in areas outside of the preserve boundaries. All told, the preserves manage to protect approximately 7800 acres of the lizard's occupiable habitat. This constitutes only about ten percent of the habitat remaining at the time the plan was prepared, and about sixteen percent of the amount of unshielded natural blowsand habitat. On the one hand, the Coachella case illustrates the considerable merits of compromise over confrontation. On the other hand, one invariably wonders whether it is the lizard who is ultimately the loser under an arrangement which deprives it of some ninety percent of its existing habitat.

## The Problem of Cost

The Coachella Valley case illustrates many of the obstacles that planners will face when attempting to minimize the "footprint" of man. An initial and obvious obstacle to the strategy undertaken in the Coachella case is the cost factor. An acquisition cost of $25 million was no small sum and led many to wonder whether the preservation of a lizard was really worth the expense. To many, such a sum seemed a wasteful use of limited societal resources. Indeed, the attorney representing the development community in the Coachella case speculated in an interview that perhaps this money would be better spent helping needy families in Los Angeles barrios. This attitude is, I believe, a fairly common one. If we attempt to assess our obligations to other forms of life in terms of the conventional economic metric, I suspect the endangered species will lose out more often than not.

*Restoration activity in the Coachella Valley Reserve*

Even for those who would see $25 million as a reasonable societal investment, there is considerable disagreement about how these funds should be derived. In the case of Coachella Valley, developers were required to pay a mitigation fee of $600 per acre, which will eventually supply $7 million of the final $25 million cost of the preserves. Thus, they pay less than one third of the cost of protecting a species which their actions are threatening in the first place.

To the development community, this contribution seems high. Since ESA is a federal law, in their minds it is entirely fair to ask that the broader public be required to pay for all or the lion's share of the cost of such preserves. To many others, myself included, the fees seem rather low, particularly when compared to mitigation requirements found in other environmental areas. Developers wishing to develop and fill wetlands, for instance, will typically be required to create or restore at least one acre of wetlands for every acre lost (often the compensation ratio is much higher). In the Coachella Valley case, land sells for in excess of $4,000 to $5,000 per acre. Thus, a $600 per acre fee would perhaps buy one-tenth of an acre of replacement habitat. This is not a very good bargain, especially in light of the speculative development profits to be had by developers and landowners of taking care of the "lizard problem."

Such fees are often criticized because of their impact on the price of new housing. This argument is spurious at best in the Coachella Valley case, given the types of housing and development being constructed. The issue has been raised in another development-species confrontation currently heating up in western Riverside County, California, where new housing construction is rapidly encroaching on the habitat of the endangered Stephens' kangaroo rat. Here, new development is being asked to pay an emergency mitigation fee of $1950 per acre (the HCP has not yet been prepared) and the affordable housing spectre is more legitimately raised. The price effects of such fees must be kept in perspective, however. Even in western Riverside County, about 60 miles from Los Angeles, the median home value is already around $110,000.

## The Problem of Conflicting Rights

In very fundamental ways, development/species disputes like the Coachella Valley case are conflicts between rights--the rights of species to exist and flourish versus the property rights of landowners and developers. This is perhaps the single most difficult obstacle for planners to overcome in protecting endangered species. This is consequently the area in which concerned planners and policymakers must direct much of their intellectual and political energies in the near future. While a system of private property rights in land holds many benefits and seems essential in a market economy, it is also evident that such rights are badly in need of redefinition. Should a property owner, land developer, or a lumber company have such complete rights of control and use that their activities are permitted to jeopardize the existence of one or more species? Our ethic of respecting the rights of other species suggests to me that when private property rights and species existence rights conflict, the latter must prevail. Indeed, this seems the original intent of the federal Endangered Species Act.

There are at least two theoretical and legal tacts that could be taken to modify private property in land to better take account of species protection. One approach is to view serious impacts to an endangered species as equivalent to the creation of a public harm. This theory has been used in the past as a defense against the unconstitutional taking challenge (i.e., that regulation is so onerous that it amounts to governmental expropriation without just compensation). Just as a landowner may have no right to use and profit from his land where, say, substantial air or water

*This date palm plantation is representative of agricultural activity that has resulted in the loss of habitat in the Coachella Valley.*

pollutants are created, so also does the landowner not have an automatic right to use the land where it jeopardizes the existence of an endangered species. A second, related approach might be to extend the Public Trust doctrine, which asserts that certain natural resources (navigable waters, beaches, and shorelines) are so essential to the public that private parties cannot usurp or close off their use (see Hunter, 1988). Endangered species could be legitimately and convincingly viewed as the objects of public trust. Both of these lines of reasoning have an anthropocentric bent, of course. If it ever does, it may be many years before our legal system will acknowledge the very right of the species, irrespective of human rights and interests (e.g., see Stone, 1974, 1987).

The dynamic and changing nature of the endangered species problem certainly also creates perceived inequities from the perspective of a landowner or developer. Is it fair to severely restrict the use of a landowner's property of land after discovering for the first time the existence of an endangered species in that particular area? Or, is it fair that one day a species is not endangered, and the next it becomes listed, with the landowner's or developer's permitted uses of the land severely changed in that one day's time?

While the plight of the landowner or developer may be cause for some sympathy, land development is by definition a risky enterprise. Changes in our understanding of endangered species should be considered as yet another element in this risk equation, and certainly not grounds for special treatment or compensation. If a landowner's property is substantially devalued because of a decision to locate a highway or some other major public or private facility in a different, less favorable location, that landowner does not usually expect, nor do we offer, compensation or special treatment. The same principle should apply when it is discovered that a property owner's land contains the habitat of an endangered species. (For a contrary view see Carlton, 1986.)

This does not mean, of course, that planners providing for endangered species protection should be insensitive to the expectations and financial investments of developers and landowners. The planning process currently underway for the Stephens' kangaroo rat may be an example of such sensitivity. Through the preparation of an interim habitat conservation plan (not yet approved by the FWS), large areas of the county have been identified in which few rats are likely to be found, where development will be allowed to proceed while the full HCP is being prepared (i.e., a section 10(a) permit will be issued for these areas). Development will not be allowed to proceed, on the other hand, in designated study areas, where the vast majority of kangaroo rat habitat is found (that is, unless developers obtain 10(a) permits individually). This "separating out" of major habitat study areas from minor, mostly non-habitat areas may prevent the county from coming to a development standstill. While some very small amount of habitat may be lost outside of the study areas (perhaps five percent), this approach seems a reasonable way to allow development to proceed.

Also, the local financial and political realities may be such that some degree of development is necessary to fund the species recovery and protection program (e.g., in the case of the Coachella preserves, providing monies to put up fences, to police habitat areas, to establish species monitoring programs, etc.). Of course, many of these recovery activities would not be necessary in the first place without the severe encroachment of people and development.

## The Problem of Scientific Uncertainty

There is a tendency among those of us who are not scientists to place substantial faith in the abilities of science and scientists to answer those questions necessary for making public policy. In the endangered species area, there are serious and perennial problems associated with the lack of scientific data and knowledge.

Among other things, our knowledge of what actions are necessary to preserve a species, for instance the size of preserves and the habitat acreage that should be set aside, is quite limited. In the case of Coachella Valley, although an effort was made to poll a number of biological experts about what the minimum preserve acreage should be, scientific understanding remains imperfect. Lizard populations have been shown to rise and fall dramatically from year to year, and while there are certain theories that might explain this phenomenon, no one is entirely certain of the cause. Moreover, while the protection of a species requires careful and protracted scientific study in order to understand its mating and foraging behavior, this process clashes dramatically with the short timeframe of landowners and developers wishing to utilize their land (and local officials desirous of expanding their jurisdiction's tax base and economic activity).

While the lack of full and accurate scientific knowledge presents a major problem to effective planning for species protection, it suggests certain strategies. One strategy, of course, is to ensure that the best biological studies possible in the short term have been prepared, and that all prevailing scientific opinion and expertise is tapped. Moreover, the pressure of landowners and developers to move ahead with their projects should not be allowed to obstruct certain basic studies (e.g., trapping and other studies designed to gauge the size and location of species, studies to understand patterns of blowsand movement, etc.). Any effective HCP must also incorporate provisions for the long term analysis and monitoring of the species, and the setting aside of

necessary funds for these activities. Finally, given these inherent scientific uncertainties, it only makes sense to err on the side of caution and conservatism when developing a habitat conservation plan or other protective strategies. Retaining much larger undisturbed areas of habitat may be more appropriate for species of which much less is understood about its life cycle or habitat needs, for example.

## The Problem of "Inequality" Among Species

When endangered species and urban development conflict, questions are immediately raised about how important the particular creature in jeopardy is to the public, relative to other species. A successful effort to protect a species requires at least tacit consent on the part of the public, and often genuine public concern about its plight. Several factors can serve to undermine the sense of concern felt and expressed both by public officials and the community at-large. Certain endangered species are put at a marked disadvantage because they are not "cute," "cuddly," or otherwise visually attractive or appealing to the public. This explains why people express a disproportionately high level of concern and affection for bears, but not bats, lions but not lizards, tigers but not tiger salamanders. The bias seems particularly evident in favor of large terrestrial mammals, especially those which are in some way anthropomorphic. The Coachella case illustrates this point, in that it was (and is) extremely difficult to get citizens and public officials very excited about a lizard. Advocates of the lizard preserves found it was often more effective to argue in favor of more parks and open space, rather than in terms of the need to protect the lizard itself. This problem is even more evident in the recent case of the Stephen's kangaroo rat--a creature for which people have developed considerable disdain.

Stephen Kellert of Yale has conducted extensive surveys of public attitudes about such wildlife issues. Not surprisingly, he found that people consistently attach a much greater importance on preserving and protecting the larger, more attractive animal species. Of substantially less importance are unattractive, even repugnant, species like snakes and insects. Kellert gave respondents a list of different animal and plant species and asked them which they would favor protecting if it resulted in higher energy costs. While 89 percent favored protecting the bald eagle, only 43 percent favored protecting the Eastern Indigo snake and an even smaller 34 percent favored protecting the Kauai wolf spider[4] (see Kellert, 1979). The psychological importance attributed to, or connected with, certain species in turn translates into a willingness to make greater sacrifices (monetary and otherwise) in order to preserve and protect them. These kinds of biases are troubling, of course, because the attractiveness or "cuddle-ability" of a species does not necessarily correlate to its ecological importance. And, more fundamental yet, no species should have to rely on its visual attractiveness to humans as a measure of its worth or right to exist.

Another aspect of this inequality issue has to do with how distinctive a threatened species is as compared with other similar species. Is a "sub-species" of lesser value and lesser priority in preservation efforts than a true species? This issue has clearly come into play in several of the local endangered species conflicts under study. In the Coachella Valley case, some argued that saving the Coachella Valley fringe-toed lizard was not as pressing or of great importance because there were two other very similar sub-species indigenous to the U.S. (the Mojave and Colorado Desert fringe-toed lizards). The casual observer would have difficulty distinguishing between the three. As another example, while the County of Santa Cruz has an endangered species ordinance which imposes special development standards in salamander habitat areas, these efforts to save the Santa Cruz long-toed salamander could be criticized because the animal is but one of five subspecies of long-toed salamander (others include the western, central, eastern and southern long-toed salamanders).

Attempting to "value" a species according to its relative distinctiveness or "uniqueness" is folly for several reasons. First, at any given point in time, the scientific community disagrees about the extent to which species are similar or dissimilar. More importantly, though, species evolve in many ways, and for many reasons we simply do not sufficiently understand. Two subspecies with only minor differences in coloring and morphology may be distinctive in many ways beyond our comprehension.

In this article, I have focused entirely on endangered species to the neglect of other non-endangered species that may also be negatively impacted by urban growth and development. This in itself raises another question of equality. Species extinction eliminates forever a chain of life that has evolved and developed over millions of years. The preservation of a species, then, must necessarily take precedence over any single organism. To ensure the long term survival and recovery of the least Bell's vireo, for example, it may be necessary to harm or kill the non-endangered brown-headed cowbird, a major habitat competitor. On the other hand, the concept of a shared planet would seem to require that when our urban areas expand and when we permit the development of land, other forms of life, particularly sentient life, should not be unnecessarily harmed. A recent case in Colorado illustrates this point. In July of 1988, an exterminator, using aluminum phosphate, destroyed an 150-member prairie dog colony in Boulder, Colorado (see Zales, 1988). The exterminator had been hired by a developer who was about to break ground on a new commercial complex. The destruction of the colony was unnecessary, in that it could have been relocated, and indeed was actually slated to be relocated. Such unnecessary violence seems contrary to an ethic of respect for other forms of life.

## The Vision of a Shared Planet

Perhaps the most disturbing aspect of the Coachella Valley case is the sheer extent of the resulting habitat loss. Is it not the epitome of human arrogance to destroy some ninety percent of a species' habitat in the name of additional resort housing and country club amenities--hardly things that could be considered human "essentials?" This loss is also disturbing in light of the history and intentions of the federal Endangered Species Act. The Secretary of the Interior is permitted to issue an incidental take permit only when it is found that the taking "will not appreciably reduce the likelihood of the survival and recovery of the species in the wild" (see Section 10(c)(2)(B)). It is difficult to imagine how such a drastic reduction of habitat would not reduce the chances of survival, and certainly of recovery. While it is not inconceivable that if ESA were aggressively enforced the political powers that be might seek to modify or severely gut it, I think it unlikely. Although in recent years the ESA has been gaining in political strength, planners continue to have a responsibility to push for its strident and aggressive enforcement.

More generally, planners and policymakers have responsibilities to consider the impacts that the projects they review, and the land use and other plans they prepare, will have on endangered species. The ethic of a shared planet requires it. Not only must direct impacts be considered, such as the obvious destruction of critical habitat, but more indirect effects as well. For instance, in Big Pine Key, Florida, road-kills of the endangered key deer will continue to multiply as development in the far northern end of the island is allowed to proceed, increasing traffic levels along Key Deer Boulevard. As another example, the desert tortoise is threatened by the introduction of power lines into the desert. These lines provide nesting areas for ravens, which in turn prey on young desert tortoise. Planners must find ways to minimize the impacts and interference of humans on endangered species, however they might result. We must be aware of and manage these indirect effects of urbanization and must be particularly sensitive to steer clear of those habitat areas especially rich in biodiversity.

But if we are serious as a society about sharing our small planet and an ethic of respect for other species, the long term implications are even more profound. They suggest a substantial rethinking of our lifestyles and our consumption patterns. For planners, there are fundamental changes implied in the types of human settlement patterns and strategies that are appropriate and permissible. Perhaps the most basic change is the rejection of unnecessary land consumption. Sharing the planet implies a responsibility to minimize our "footprint" and a responsibility not to squander the limited common habitat. Among the specific land use and planning policies that seem required by such an ethic include: higher urban and suburban densities and more compact and contiguous development patterns; the redirection of growth back into existing urban centers and the revitalization of declining areas; infilling and utilizing already degraded and committed lands for new developments before encroaching on environmentally-sensitive habitat areas; and restricting the extent to which second homes and other less-essential forms of development are subsidized or permitted at all.

The vision of a shared planet may also call for other changes in lifestyle that extend beyond simply the amount of land we directly consume for development. For example, a number of contemporary threats to species in this country involve water projects (e.g., dams, reservoirs, diversion systems, etc.). The vision of a shared planet may necessitate sharply curtailing the extent to which we wastefully consume a scarce resource such as water--particularly in the West.[5] The same could be said about energy consumption, the consequences of which can severely and irreparably damage the habitat of endangered and non-endangered species (e.g., the destruction of a riparian ecosystem as a result of a hydro-electric project; the creation of acid deposition as a result of coal-burning power plants; and the tremendous damage done by the recent Alaskan oil spill). Human-induced global warming due to excessive carbon dioxide emissions is a particularly serious threat in that many species will be unable to adapt to new climatic conditions largely as a result of human settlement patterns.[6] There are many ways in which being a "plain citizen" may require rethinking basic lifestyle and consumption patterns. And, perhaps most fundamentally, the notion of sharing the planet will require serious efforts on a global scale to control population growth. Such strategies as higher densities, urban infilling, and energy conservation can do only so much to reduce the human impact when the quantity of people, activities, and resource demands are expanding at exponential rates.

At the very least, we must, as a species, enter a period of reflection about our position here on Earth and the responsibilities we have to its other inhabitants, as well as to our own descendants. Planners are in the unique position to initiate and lead the discussion and provide practical insight into how the vision of a shared planet can be translated into actions, laws, and policies.

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## Notes

1. There are approximately 1500 animals and 2500 plants currently classified as candidate species.
2. Taylor goes on to construct a fairly detailed set of ethical standards for treating other life forms, which he argues follows directly from the attitude of respect. These include four basic rules of conduct (the Rule of Nonmaleficience, the Rule of Noninterference, the Rule of Fidelity, and the Rule of Restitutive Justice) and five priority principles for deciding conflicts between human and non-human interests (the principle of self-defense, the principle of proportionality, the principle of minimum wrong, the principle of distributive justice and the principle of restitutive justice).
3. The observations in this article also draw from interviews conducted with key participants in three other Habitat Conservation Planning processes: the North Key Largo, Florida HCP (involving the American Crocodile, the Schaus swallowtail butterfly, the Key Largo woodrat and the Key Largo cottonmouse); the San Diego least Bell's vireo HCP; and the Riverside County Stephens' kangaroo rat HCP. For a general overview of several of these HCP experiences, see Webster, 1987.
4. The phrasing of the response categories was actually: "A bird, such as the Bald Eagle"; "A snake, such as the Eastern Indigo Snake"; and "A spider, such as the Kauai wolf spider."
5. It may also suggest that we rethink the extent to which we allow current national development patterns to continue. Does it make sense to continue to allow explosive population growth in arid areas like Southern California which necessitate environmentally (and financially) costly water diversion projects? Should we seek ways to direct growth at a national scale to those areas which have the greatest natural carrying capacities and where the human species can be accommodated with the fewest impacts?
6. The global warming problem does suggest certain conservation strategies such as protecting large contiguous blocks of habitat and ensuring that movement corridors are preserved. See Harris and Gallagher, 1989, for instance.

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# Agricultural Colonization and the Social Dimension Of Ecological Destruction in Ecuador's Amazonia

**Francisco J. Pichon**

*Tropical deforestation is the subject of heated debate. This article examines the relationship between smallholder agriculture and ecological destruction in Ecuador's Amazonia. Poverty, unequal land distribution, low agricultural productivity, and misguided government policies are all causes of deforestation, argues the author. Tropical deforestation in Ecuador will continue at an alarming rate unless the economic incentives encouraging deforestation are removed.*

## Introduction

The world's tropical rainforests are disappearing at an alarming rate. These forests, which once occupied sixteen million square kilometers of the earth's surface, today cover only nine million square kilometers. Africa alone has lost over half of its rainforest while Latin America and Asia have lost forty percent (Myers, 1986). In many countries, the rate of deforestation is accelerating. Most of the forested areas of Bangladesh, India, the Philippines, Sri Lanka, and parts of Brazil could be gone by the end of this century. Only in the Congo Basin and in some of the most isolated areas of Amazonia does the rainforest remain largely intact.

Deforestation and its associated symptoms of environmental collapse in the developing world are the subject of considerable debate and concern. Experts disagree about how rapidly primary forests near the equator are being cleared or otherwise disturbed (Sedjo and Clawson, 1983; Allen and Barnes, 1985; Myers, 1980). Likewise, tropical deforestation's social costs are difficult to estimate, because natural scientists cannot precisely describe deforestation's impacts on soil quality, climate, and biological diversity; furthermore, attaching monetary values to these impacts is difficult (Southgate and Pearce, 1988). Tropical deforestation results in the loss of timber, fuelwood, fibers, canes, resins, oils, pharmaceuticals, fruits, spices, and animal hides.[1] Long-term costs include soil erosion, flooding, and the siltation of reservoirs and hydroelectric facilities; destruction of wildlife habitat; and climatic changes associated with the removal of protective forest cover in tropical regions. But perhaps the most important single long-term cost of deforestation is the irreversible loss of biological diversity.

Many of the species native to tropical rainforests are invaluable; for example, vincristine and vinblastine, derivatives of a wild periwinkle found in the forests of Madagascar, have dramatically improved the treatment for leukemia and other cancers. Since less than one percent of tropical plants have been screened for potentially useful properties, ongoing deforestation will result in the permanent loss of other species before their value is recognized (World Resources Institute, 1988). If present rates of deforestation continue, it is estimated that more than thirteen thousand plant species in Latin America will be extinct by the end of this century. In a worst case scenario as many as sixty thousand could suffer this fate (Wolf, 1988).

## The Underlying Causes of Deforestation: "Blaming the Victim"

The causes of deforestation and subsequent deterioration of tropical soils and other natural resources in the humid tropics vary significantly among regions, as well as within countries of the world. Most observers agree that small subsistence farmers who have settled in the tropical rainforest are the primary agents of deforestation in the developing world. According to Myers (1986), this small-scale agricultural colonization results in about 150,000 square kilometers of forest depletion annually.[2]

Most recent anthropological work on peasant and small farmers has emphasized the small farmers' rationality and adaptive behavior (Schultz, 1964; Wharton, 1971; Netting, 1968; Bennett, 1969; Johnson, 1971; Brush, 1977; Barlett, 1980). While variability in knowledge and skills among local populations has been recognized, much attention has been given to the ways in which people alter their behavior to make best use of available social and natural resources

(Collins, 1986). Yet the destruction of tropical lands has often been attributed to poor decisions of small producers.

But holding the small farmer responsible for tropical deforestation amounts to "blaming the victim," since the real causes of deforestation are likely to be poverty, unequal land distribution, and low agricultural productivity combined with rapid population growth. To this list one must also add misguided public policies which either purposely or inadvertently encourage rapid depletion of the forest (Collins, 1986).

## Ecuador: A General Background

Ecuador has evolved from a predominantly agrarian country into an oil producer nation within the last two decades. The transformation of the Ecuadorian economy in the 1970s brought rapid economic growth and affluence unparalleled in Ecuador's history. In the midst of this prosperity, economic, social, and political changes occurred which moved Ecuador toward relative modernization and raised expectations for sustained economic growth and wealth. Yet, as the government espoused industrialization and income transfer programs, Ecuador increased its interdependence within the world economy; thus, becoming more vulnerable to external shocks, as well as increasing indebtedness due to burgeoning external borrowing. In the 1980s, Ecuador's economy slowed down, responding to the world recession with sagging demand, high interest rates, rising protectionism, declining prices for primary export commodities, and growing scarcity of capital resources. These forces have culminated in a difficult balance of payments situation for the country.

Ecuador has followed similar developing patterns common to other developing countries. Throughout its history, Ecuador has contributed the raw materials necessary to set up not only its own infrastructure, but also that of industial countries which have profited from mistaken policies of exploitation and the lack of environmental guidelines (Sarmiento, 1987). Ecuador does not have a national program for the productive use, management, and conservation of its natural resources. There is neither a general national law that poses specific norms and standards for the development, use, management, and conservation of natural resources, nor a suprainstitutional coordinating or planning body (Fundacion Natura, 1986).

## Oil Development and Government Attitudes Toward Amazonia

Mainland Ecuador is divided into three regions: Coast, Sierra, and Oriente. The Coast and Sierra regions feature a "bi-urban schism" between Andean Quito and coastal Guayaquil. Quito, the nation's capital, burgeons with political-economic strength drawn from petroleum revenues. Guayaquil is a commercial port city which grew out of a base of commercial agriculture, shipping, and banking. National attention within this two city dialectic of economy and social relations has increasingly turned eastward toward Ecuador's small segment of Amazonia.

The Amazon region, east of the Andes mountains, is the country's major zone for agricultural expansion. This region faces the greatest dilemmas of adequate environmental management. Government policies have indirectly encouraged settlement in Amazonia by viewing colonization as an alternative to land reform in other regions of the country, and

*Satellite photo of the Napo region 1987. The white, criss-crossed areas reveal the extent of deforestation along roads built by oil companies.*

as a way to provide a mobile labor force for the oil industry in the Amazon (Bromley, 1980; Collins, 1986; CLIRSEN, 1987). In the last two decades, the massive road-building programs of the oil industry have made large areas of Amazonia accessible for the first time, while government-sponsored settlement schemes have simultaneously attracted migrants from the Sierra and coastal regions. Special fiscal incentives and subsidized credit lines have encouraged cattle raising which has allowed small populations to have a large impact on the environment (Hiraoka and Yamamoto, 1980). Furthermore, agricultural colonists face various difficulties in land titling, credit, and marketing which reflects the government's lack of a well-defined policy for smallholder colonization (Bromley, 1980).

The pace and extent of colonization in Ecuador's Amazon region has been more heavily influenced by the investments and preferences of the multinational companies dealing in oil, tropical agricultural products, and timber than by sound environmental management criteria promulgated by the Ecuadorian government. The development of tropical colonization zones in Ecuador has occurred on a temporary basis, while the extraction of wealth is possible and highly profitable for national and international interests, rather than on a continuing basis with aims of improving the welfare of the inhabitants and promoting long-term settlement in conjunction with sustainable environmental management.

The petroleum industry's interests consistently prevail over those of conservation management in Amazonia. This is largely because of the strong political power backing the oil industry. The oil sector is not adequately regulated to prevent it from exerting noxious impacts upon the environment. So far, the oil companies operating in the Amazon region industry seem unwilling to invest in less damaging but perhaps more costly technologies to conserve and protect the environment (Fundacion Natura and FONAPRE, 1988). Furthermore, under this resource exploitation philosophy, environment and conservation in Ecuador's Amazonia is under the jurisdiction of one particular agency: the Department of Protected Areas and Wildlife. Environmental management is not the concern of other agencies undertaking development projects in the region (Uquillas, 1987).

Although a national protected areas system, providing the Amazon region with some 4 million acres of protected land (57 percent of the total protected land in Ecuador), has existed in Ecuador since 1979, true protection is limited. "Protected" areas are those areas presently too remote for colonization or intervention of any kind. Meanwhile, areas close to the settlement frontier or rich with mineral resources are being disturbed: the National Parks of Yasuni and Cuyabeno are or soon will be criss-crossed with roads for oil exploration. Depending upon whether oil is found within the limits of these areas, opening roads will inevitably lead to further forest conversion and occupation by settlers (Fundacion Natura and FONAPRE, 1988; Sarmiento, 1987).

## Social and Ecological Cycles of Decline

Understanding of the ecological issues related to the easily degradable tropical lands of Ecuador's Amazon region has increased sufficiently in the past decade to allow one to move beyond analysis to actual resource management. Much has been learned about the variable properties of tropical soils and their relative susceptibility to deterioration. Agriculture, cattle raising, logging, and oil extraction, for example, pollute and degrade the renewability of

the fragile, natural ecosystem of the Amazon region. At the same time there has been a growing awareness that a more sophisticated knowledge of the region's ecology and an increased repertoire of productive techniques do not necessarily ensure sustained and successful resource management.

Environmental deterioration in this region cannot be understood without considering how land tenure, credit policies, provision of land titles, and other institutional factors condition the resource management strategies of the producers who work the land. Thus, it is possible to ask whether the processes of environmental degradation that have accompanied the settlement of new regions result only from the idiosyncrasies of climate and culture; or, whether significant patterns of interaction among the social context, producer decisions, and environmental deterioration can be identified. There is enough evidence to argue that low productivity and ecological deterioration along Ecuador's Amazon are the results of misguided incentives for improper land uses; and are not the results of the exploitation of land that should remain untouched. A case for this argument is made below by exploring what would seem to be poor and self-destructive management practices by small farmers in the colonizing areas around the Lago Agrio region.

## A Case Study of Agricultural Colonization in the Ecuadorian Amazon

Hiraoka and Yamamoto (1980) describe spontaneous and planned colonization schemes in northeastern Ecuador. Because of road construction and the demand for labor resulting from petroleum extraction, these areas were opened to colonization in the early 1970s.

The Lago Agrio region, in the northeastern province of Napo, is presently experiencing severe environmental degradation. Approximately ten thousand workers were brought to the Lago Agrio region to work on a variety of projects related to oil exploration. After the projects were completed, some five to ten percent of these people chose to remain as small farmers. At the same time, the Ecuadorian Agrarian Reform Institute (IERAC) began recruiting and transporting settlers to the region. While this planned settlement was short-lived, the opening of roads attracted many colonists. Today, according to Fundacion Natura of Ecuador, a nonprofit environmental organization, some fifty thousand people have settled in the area around Lago Agrio alone.

Perhaps more than any other colonization area in Ecuador, Lago Agrio has experienced excessive deforestation and exhaustive use of farmland over the last two decades. This has limited the effectiveness of colonization as a social or resource utililization policy for the region.

Hiraoka and Yamamoto found that institutional instead of ecological factors posed the most immediate challenges to small producers. First, the costs of obtaining a plot were high, and included mandatory membership in an agricultural cooperative. Second, in addition to the cost of the land, there were costs associated with surveying, mapping, and registering the land. While this amount could be amortized over twenty-five years, settlers could not receive permanent title until the amount was paid in full; without permanent title they could not obtain credit. Since legal transfer was also impossible with this provisional title, those farmers were forced to sell their lots before their debts were paid in full and could only obtain a fraction of their real value (Collins, 1986).

All of these factors impeded capital accumulation among small producers. Some impatient settlers converted their plots to pasture before they amassed the capital to begin ranching. These partially formed grasslands were quickly absorbed by speculators. The settlers who were forced to dispose of their lots either left for urban centers, moved forward on the settlement frontier, or became part-time laborers for the ranchers, maintaining a small part of their former lots for sub-

*Coffee-producing farms in Napo region showing evidence of deforestation*

sistence farming purposes (Hiraoka and Yamamoto, 1980). Other settlers lost or abandoned their lands because they were unable to make installment payments or were unable to cover subsistence needs, or found off-farm employment.

Those who escape this cycle find ways to move into cattle ranching, marketing, or service activities; they are not necessarily better managers (Hiraoka and Yamamoto 1980). They must, in other words, "get big... or get out" (Hecht 1981, 82). In the end, socially created conditions of indebtedness and economic insecurity have proven to drive cycles of environmental decline, which in turn accelerate loss of land and social differentiation among settlers.

Furthermore, there is a local trend toward cattle ranching which is fostered by the small farmers' need to prove land possession or land "improvement" to the government. According to current legislation in Ecuador (Fundacion Natura and FONAPRE 1988), this is done most expediently through the conversion of forest land into another use (at least eighty percent of the forest area that is to be colonized must be cleared before property title can be granted, thus stimulating deforestation). Also, the conversion of land to pasture--whatever its quality or potential usefulness--is much easier than its cultivation for agricultural purposes. In addition, the lack of adequate roads makes it difficult to transport agricultural products to market. Cattle, however, can be easily herded to market. Furthermore, cattle raising is not labor intensive and is less risky than farming. Despite the advantages to the farmer, cattle raising has resulted in greater deforestation and more intensive land-use patterns characterized by less careful husbandry.

As the settlers have encountered problems in their farming activities, an increasing number of them have had to sell or lose their lands to larger interests or abandon them in the face of declining yields. Consequently, large holdings have been consolidated in the region. Fundacion Natura of Ecuador has reported that five hundred acre holdings are emerging along the Lago Agrio-Chaco region, and other cattle ranching and oil palm enterprises have gradually accumulated land bought from small settlers. As a result, a variety of so-called precarious land tenure forms (owner-to-worker association forms that have been considered noxious, unfair, exploitative, and therefore legally banned in other regions of Ecuador) have arisen in the region.

*Cattle ranching along road in Napo region*

Although deforestation in some instances provides some short-term benefits through timber exports and agricultural production or other related activities, it also imposes huge long-term costs for the country. As a consequence of these processes, Fundacion Natura (1986) has indicated that by 1986, deforestation absorbed at least 2.5 million acres of tropical forest, and this figure refers only to areas where legal land titles have been granted. This figure does not include the extensions of territory occupied by national and international companies dealing in oil, tropical agricultural products and timber, as well as those areas accounting for road-building programs. According to the

Direccion Nacional Forestal, by 1968 deforestation occurred in an area covering 150,000 acres; by 1974, this expanded to 500,000 acres; and by 1976, to 1 million acres (CONADE-UNEP, 1987). The United Nations Food and Agriculture Organization estimated that deforestation in Ecuador's Amazon region reached 750,000 acres in the period between 1976 and 1980; and further expanded to 850,000 acres between 1981 and 1985 (Uquillas, 1987).

## Conclusions

Recent years have seen an increasing interest on the part of development agencies in the promotion of viable small farm sectors in Latin America. Governments have promoted or allowed the agricultural colonization of easily degradable land areas. Nevertheless, the prevalence of failure among small farmers raises fundamental questions regarding the viability of small farm colonization of tropical lands.

The initial poverty of small producers in settlement areas along Ecuador's agricultural frontier is an impediment to sound resource management; but government policies further exacerbate this problem by pursuing policies that engender smallholder indebtedness. Thus, in order to formulate policies for land use and resource management in easily degradable land areas such as the Amazon, the links between social and ecological dynamics must be made explicit. Social factors must be incorporated into models of ecosystem change in ways that go beyond simple descriptions of behavior and reflect a more sophisticated understanding of the contexts within which land use decisions are made (Collins, 1986). Research is required that will provide an improved understanding of the ways in which credit lines, land titling, and factor commodity markets affect the behavior of small settlers in a variety of frontier settings. Such insights can then be incorporated into models of socio-economic and environmental interaction that characterize the colonization of tropical lands. Ultimately, these models can be used to create policies designed to promote sustainable production, in keeping with environmental realities and the overall goals of agrarian policy in a country.

Questions about land use and ecology are tied to these kinds of policies and practices, as well as the larger political economic context. They cannot be answered without reference to the differential interests of groups vying for land, or without consideration of who benefits and who suffers as a result of the changes that occur (Collins, 1986; Mahar, 1988).

Recognition of the links among structural incentives to produce for short-term gain, deterioration of resources, and loss of land by small holders challenges the simple explanations of how new tropical lands can best be brought into production. Assertions that these lands are simply unsuitable for agriculture, or that they require the superior management skills and capital resources of larger enterprises, are perhaps no longer tenable. If a political commitment exists to support agricultural colonization, and if available knowledge is relied upon to create incentives for sustainable resource management, then long-term settlement plans might succeed.

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## Notes

1. Little is known about the extent of annual losses of forest products through deforestation. Estimates for the Cote d'Ivoire and Nigeria suggest that 50-100 million cubic meters of quality logs--3-6 times the annual production of sawlog and veneer logs--are lost each year in these countries through clearing and burning (World Resources Institute, 1988).
2. Other major proximate causes of deforestation include: commercial logging (45,000 square kilometers per year), fuelwood gathering (25,000 square kilometers per year), and cattle raising (20,000 square kilometers per year) (Myers, 1986).

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# The Impact of Environmental Liability on Land Use Planning

**John Buckley**

*The threat of environmental liability discourages the resale and reuse of industrial and commercial property. This article discusses the source of environmental liability and reviews its effects on purchasers, lenders, and insurers. Planners must understand the pervasive and potentially devastating impacts of environmental liability on developed and virgin land.*

Free alienation of real property has always been a reasonably well achieved goal. With the passage of various environmental statutes by Congress, however, a new barrier has sprung up to slow the purchase and sale of real estate. This barrier is environmental liability, and it has its largest impact on existing industrial and commercial property.

## Historical Perspective on Real Property Law

In recent years, the laws affecting ownership of land in the United States have fundamentally changed. Under the common law generally adopted by the individual states from the old English system of law, property consisted of a bundle of rights. The owner of property was an owner of rights, whether they were mineral rights, water rights, or the right to exclusive possession of the land. Property entailed rights.

Early in the twentieth century the law recognized the ability of the government to regulate the use of these rights without compensating the owner. This regulation, largely expressed through zoning, permitted restrictions on the use of land so long as the restriction did not consume the entire bundle of rights. If the regulation did in fact consume the bundle, then the regulation constituted a "taking" and had to be compensated for by the government.

In 1980, Congress established a new bundle of property rights which entailed responsibilities. This new bundle had been developing for some time, because of dissatisfaction with the remedies available under the common law and zoning. While the common law had recognized responsibilities attached to the use of land, there had never been an omnipresent bundle of responsibilities associated with its ownership (except possibly the responsibility to pay taxes). The market's perception of land ownership is changing, which affects the potential for reuse of many forms of real estate. The land use planner must factor this changing perception into proposals.

## The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

In 1980, during a lame-duck session, Congress hastily enacted an environmental statute known as the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or "Superfund"). At the time it was heralded as one of the most frightening and promising of environmental statutes. Both of these descriptions have proven true. In part, the strength of CERCLA resides in its initially vague drafting, since clarified by the 1986 amendments.

The statute earned a well-deserved "quirky notoriety" with judges who attempted to interpret its extensive liability scheme. The legislative history of the statute is one of almost comical contradiction, making interpretation difficult at best. Still, this vagueness and contradiction are the elements that have made the statute so strong. Courts have been given wide latitude in fashioning liability for environmental harm. And they have been liberal in finding liability.

## How CERCLA Works

CERCLA established a Hazard Response Trust Fund, the so-called "Superfund." The government uses this fund to clean-up hazardous waste sites known as "Superfund sites." The Superfund was initially funded by oil taxes, although it is intended to be refunded by individuals or corporations (parties) responsible for contaminat-

ing the sites. The idea is to get the sites cleaned quickly and litigate over who is to blame later.

Various state agencies and the Environmental Protection Agency (EPA) identify the Superfund sites. The EPA has the task of ranking these sites in priority order for cleanup. Once the sites are catalogued, the EPA attempts to identify the parties who were responsible for contaminating the sites. The statute establishes who will be liable as responsible parties subject to limited defenses. The parties the EPA initially identifies are known as Potentially Responsible Parties (PRPs). If the PRPs are willing, capable, and circumstances permit, the EPA may allow them to clean up the site themselves. Even if they are not willing, the EPA may select one or more of the PRPs and order them to clean the site.

## Who is Responsible

There are six different classes of parties who may be responsible for the cleanup costs of a contaminated Superfund site. These are: (1) current owners of the real estate, (2) current operators of activities on the real estate, (3) past owners, (4) past operators, (5) those who transported hazardous substances to the site, and (6) those who generated the hazardous substances transported to the site.

These parties are "jointly and severally liable." The parties are joined with respect to the total cost of cleanup (that is, they cannot just clean their share). Moreover, any one party may be severed from the rest and required to pay the entire cleanup cost. Joint and several liability means that one party who contributed minimally to contaminating a site, yet who has "deep pockets," may be required to clean the site. Many people find the "deep pocket" theory of liability manifestly unfair, especially when coupled with true "strict liability."

## The Elements of Liability

Strict liability, simply put, is liability without fault. Under strict liability one need not show negligence on the part of the defendant to recover from him. The classic tort liability scheme consists of four elements. First, the defendant must have some legally recognized duty. Second, he must breach that duty. Third, his breach of the duty must cause the injury. Fourth, the injury must result in damage to the plaintiff.

For example, take the simplified case of an automobile collision. Person *A* runs a stop sign and collides with *B*. *A*'s duty is to obey the stop sign. By failing to heed the sign, *A* breached a legally recognized duty. If *B*'s car or person are injured in the collision, *B* can recover damages. *B*'s burden of proof is not difficult. Assume, however, that *A* has no money, but *A* admits that he was distracted by *C* walking her dog without a leash in an area where dogs must be on a leash. *C* has also breached a duty, but that breach was probably not a cause of *B*'s injury, at least not a foreseeable or "proximate" cause. In a case to recover damages from *C*, *B*'s burden would be difficult to carry. Finally, assuming *C* also has no money, what if the entire episode occurred in *D*'s parking lot? Does *D* have a duty in this situation? In a case against *D*, *B* would have trouble with all of the elements of the classic tort: duty, breach, causation, and damages.

CERCLA eases the burden on the plaintiff, usually the EPA, for all of these elements in the case of Superfund sites. The statute imposes a duty on any of the six classes of parties any time they deal with hazardous substances. The duty is simply to control the hazardous substances and keep them from being released to the environment. A party breaches that duty when a release or "threat of release" to the environment occurs. The duty is "strict" because there is no need for the plaintiff to prove negligence. The plaintiff only needs to show that the threat occurred. Why it occurred is irrelevant in a strict liability scheme. In comparison to the above auto collision example, if *A* proved that the stop sign had been knocked over or obscured by trees, he might not be liable for negligence, but a strict liability theory would hold him liable regardless. Fortunately for *A*, drivers are never held strictly liable.

The release of a hazardous substance need not cause any harm; in fact, release need not occur, only threat of release. The threat, however, must cause EPA or some other party (perhaps a state, city, or private individual) to react by cleaning the site. The clean-up cost represents the damages EPA may recover. The following section will examine these four elements more closely and discuss why CERCLA liability is so easy to fall into and why it is so devastating.

### *Duty: Hazardous Substances*

CERCLA imposes a duty on those who handle, or unwittingly handled in the past, a category of chemicals now (or sometime in the future) designated as hazardous substances. At first blush, this sounds reasonable, but when one realizes the relative harmlessness of some of the chemicals listed, the range of CERCLA's effect can be quite startling.

Many hazardous substances are in routine household use. While some hazardous substances will kill, or cause mutations or serious injury, many are relatively innocuous. And whether innocuous or not, the public's exposure to some of these chemicals is extremely common. In fact it is easy to imagine that everyone has handled and disposed of some product containing a hazardous substance. For example, acetone is a major ingredient in fingernail polish remover; benzene is a major constituent of unleaded gasolines; phosphoric acid is an ingredient in Coca-Cola. All of these chemicals are hazardous substances.

Therefore, it is reasonable to assume that every business in America uses hazardous substances. Because the list of

hazardous substances encompasses so many commonly used chemicals, almost all manufacturing industries are major users.

*Breach: Threat of Release*

Another key to comprehending the range of CERCLA's application is an understanding of what constitutes a breach of the hazardous substance duty. The breach occurs when there is a threat of release to the environment of some hazardous substance. The threat is merely of release, not anything to do with danger or health effects. Danger is presumed since we are dealing with hazardous substances.

A release is movement of a hazardous substance from anything into the environment. The environment includes air, water, soil, and ground water. If the substance spills from a barrel to the ground, it is a release; if it seeps from a landfill into the soil, it is a release; if it evaporates from an open container, it is a release. Releases occur constantly, and anyone who handles a hazardous substance will have the impossible task of keeping track of it all.

*Causation*

Causation in the sense of physical danger or injury is not required. What is more startling is that causation in the sense of release is not required either. If the defendant places a hazardous substance in a landfill, he may be held liable even if the hazardous substance threatening release is different. The defendant need not cause the release. He must only be one of the six parties described earlier, for example, the property owner.

*Damages*

Damages include the cost of response and remedial action to clean the site. These costs can be quite substantial since the sites must be cleaned to exceedingly low levels. The average site cleanup cost in 1984 and 1985 exceeded twelve million dollars.

*Defenses*

There are only five real defenses to CERCLA liability, and none of them are very good. An act of God or an act of war is the first defense. These are both closely circumscribed. It has been argued by the EPA that a fire started by lightning striking a warehouse is not an act of God because it is foreseeable and preventable by lightening rods.

The second defense is that the EPA granted a permit for the release. The EPA is not likely to grant permits for the release of hazardous substances without substantial assurance of no possible harm. This defense is available to very few property owners.

The third defense is that the release is not a release. There are four categories of releases that are specifically excluded. These are releases solely from the workplace (regulated by the Occupational Safety and Health Administration), releases from some engine exhausts, releases of some nuclear materials (regulated by the Nuclear Regulatory Commission and Department of Energy), and the normal application of fertilizer. This exception also applies to a very limited class of property owners.

A fourth defense is available if the hazardous substance arrived on the property because of acts of a third party with whom the owner had no dealings. This is available only if the owner took reasonable precautions to prevent such occurrence. This defense is fairly good if the owner is the victim of "midnight dumpers," but if the owner in any way agreed to receive the material or knew that it was coming, the defense is not good.

Finally, the fifth defense is that of an innocent landowner or innocent purchaser. If the owner came into possession of the land without knowledge that it was contaminated and made "all appropriate inquiry" without discovering its contamination, then he may be deemed innocent and without liability. All appropriate inquiry in the case of commercial property requires an extensive environmental audit. This audit must be performed by professional engineers (evaluating facilities, chemicals and discharges), geologists (evaluating soil and ground water conditions), and attorneys (performing title history searches, including leases). Environmental audits are expensive and invariably uncover negative information.

*Effect of Liability*

The effect of liability can be summarized very simply with actual case histories. A company purchased a tract of land for $48,000 and the estimated cleanup bill was $2 million. In another case, Maryland Bank & Trust Company foreclosed on a piece of property and learned that they had not only lost their security interest, but would also have to pay for the site's cleanup as its owner. Finally, insurers are being hit with coverage suits from their insureds. UTC, for example, sued 240 insurers for pollution coverage regarding its properties. In many cases the policies are standard Comprehensive General Liability policies written before CERCLA, which did not anticipate its absolute and retroactive liability scheme.

## Insurers

While insurance companies are not subject to CERCLA liability, their reaction to it is important. If insurance companies reason that potential liability is great, they will charge high premiums. If, as many insurers contend, environmental impairment is not a random insurable event and instead a certain eventuality, they will refuse to insure entirely.

Insurance companies have incurred substantial, unanticipated losses for environmental damages. To reduce their losses, insurance companies are generally refusing any environmental impairment liability insurance and auditing policyholders to minimize risk. This has created a dire shortage of needed insurance. Where there are companies granting environmental policies, the policies are limited in scope, usually covering only sudden occurrences.

## Lenders

Lenders are often placed in a Catch-22 position. On the one hand, they do not want to foreclose on potentially contaminated property. On the other hand, they want to protect their security interest. If banks have already loaned money, they might consider imposing restrictions on the activities of their borrowers to reduce the likelihood of CERCLA action. This activity, however, would be considered operation of the site and subject the lender to the same liability that foreclosure brings. Generally, a bank's involvement in the business affairs of a company handling hazardous substances is suicidal. The best tack for money already lent is to wait and see, and hope for the best.

With new loans, however, banks are in a better position to protect their investments. All financial institutions are expanding the methods they use to identify environmentally high-risk borrowers. Pre-loan environmental audits are common place. Soil tests are frequently required for existing industrial facilities. Costs are borne by the potential borrower, not the bank.

Many banks will require borrowers to perform continuous environmental audits during the life of the loan to ensure environmental compliance. This treads close to meddling in the affairs of the borrower, but most banks only require an independent auditor to report the audit results to the borrower's top management, forcing the borrower to stay informed.

Finally, many lending institutions will require the borrower to secure environmental impairment liability insurance. As noted above, however, insurance is scarce. And when it is available, insurance companies put policyholders through another set of hurdles. For many borrowers the insurance requirement essentially means that no loan will be available.

## State Government

Some state governments have stepped into the CERCLA land transaction problem and added to the confusion. New Jersey, for example, passed the landmark Environmental Clean-up Responsibility Act (ECRA). The transfer of industrial property will not be approved by the state environmental agency until the site is cleaned of all contamination. Delays of several months in the transfer of property are common. The whole thrust of the statute is to prevent acquisition of liability by innocent purchasers.

Fortunately, states passing ECRA type legislation have been restricted to the northeast and California. It seems unlikely that either North or South Carolina will propose such legislation given the New Jersey experience.

## Purchasers

CERCLA liability substantially deters purchasers of existing industrial property. The liability itself is frightening: the average site cleanup costs over $12 million.

In addition, the acquisition of loans and insurance is difficult and expensive, if not impossible. Finally, there are often substantial delays in acquiring loan money to the point where the transaction may no longer be worth its original value.

The length of delays, the size of the additional transaction costs, and the viability of the sale itself will all be a function of the likelihood of finding contamination on the

*The higher probability that an existing industrial facility contains hazardous substances leads to greater scrutiny of the site by lenders, purchasers, and insurers, which increases the costs of the site.*

site. If the site is an existing industrial facility, it is more likely to have hazardous substances than if it is virgin property (although some property that appears clean is not). The higher probability leads to greater scrutiny of the site by the lender, purchaser, and insurer, which increases the costs of the site regardless of whether the site is clean to begin with.

Industrial site purchasers are increasingly subject to market pressures that force their selection of unspoiled, virgin property for commercial development. Virgin property must be cleared, landscaped, and developed. Moreover, such property is often far from desirable business districts. Because of the threats of environmental liability, virgin property will be selected over existing land with viable structures and superior location. The consumption of this virgin property is actually being propelled by the most powerful of environmental statutes. The irony is striking.

## What the Planner Can Do

Planners must be aware of the difficulty surrounding the reuse of industrial and commercial property. Projected development into outlying areas should exclude land that has already had commercial uses. In addition, a higher percentage of outlying land should be zoned for commercial or industrial development; as businesses come and go, they will not reuse existing locations nearly as often as the planner might anticipate.

Another consideration is the acquisition of former industrial or commercial property by local governments for infrastructure or other uses. City and county governments are not excluded from liability (except through escheat from tax delinquency). If local governments purchase property outright or through eminent domain, they can be held liable for cleanup costs. Therefore, planners should not rely too heavily on projected reuse of commercial properties by the local government. Such properties, once audited, may turn out to be highly undesirable.

The ability of the planner to affect legislation may be limited; however, the following suggestions may prove valuable.

*Local: Cover the Cost of Audits*

At the local level, the planner may be able to institute regulations that will subsidize environmental auditing of commercial property designated for continued business use. This subsidy can be in the form of an actual payment to potential purchasers who commission the audit, or it can be performed by the local health and environmental agency. In either case, the local government should retain access to the report and permit its use by subsequent potential purchasers. In this way the local government will improve its land planning strategy while gaining valuable environmental information for the community.

*State: Use Conversion Tax*

At the state level, planners should make legislators aware of the problems encountered by New Jersey under the ECRA statute. Legislation to protect innocent purchasers should be drafted to prevent the transactional barriers created by ECRA.

In addition, a one-time use conversion tax would provide an incentive to companies to reuse existing industrial property. This type of tax would be imposed when non-industrial property was converted to industrial use. Industrial use would be defined as a particular level of hazardous substance use.

The size of the tax could be geared to the type of effect desired. If, on the one hand, the desired effect is simply to encourage companies to consider existing locations, then the tax should be equivalent to the additional transaction costs associated with existing industrial property. This would be approximated by the cost of an environmental audit of a similarly sized tract. If, on the other hand, the desired effect is to strongly encourage use of existing commercial property over undeveloped land, then the tax should reflect the relative risk between the two alternatives. The size of this tax would be quite substantial and could drive companies out of state.

*Federal: CERCLA Amendments*

Amendments to CERCLA will probably not occur for several years. But when amendments are passed, planners should be prepared to suggest taxes or other incentives to offset the market incentives to consume undeveloped land. This may prevent flight to neighboring states, but it might not prevent flight to overseas locations, which has already occurred.

## Conclusion

CERCLA liability has propelled an undesirable environmental and land use phenomena: the consumption of undeveloped land for commercial and industrial uses. The planner must understand the effects of CERCLA liabilty in order to pursue legislation at the state and local level to alleviate the development pressures on virgin land and permit cost effective reuse of commercial and industrial property.

**John Buckley** is an Environmental Engineer and a member of the North Carolina Bar. He is an attorney with the firm Miles & Stockbridge in Baltimore, Maryland.

# 1989 Annual Conference Alumni Association of the UNC-CH Department of City and Regional Planning

**Carolina Planning Staff**

The Alumni Association of the Department of City and Regional Planning, University of North Carolina at Chapel Hill, held its annual conference and business meeting from October 6-7, 1989. The conference featured alumni discussions on the role of planners as leaders, as well as a special session for students on career preparation.

## Planners as Leaders

On October 7, the Alumni Association and *Carolina Planning* sponsored two panel discussions on the role of planners as leaders. One panel, consisting of John McClain, Mary Joan Pugh, and Lanier Fonvielle, discussed the topic, "Are Planners Good Leaders?" Panelists for the second discussion, "Expanding the Leadership Role for Planners," were Dwight Merriam, Laura Bachle, and Antoinette Tupponce. Jeffrey Swain moderated both panels.

*Are Planners Good Leaders? A Current Assessment*

*John McClain* ('67) of the Greater Washington, DC Board of Trade and an American Planning Association Board Member, opened the discussion by showing transportation plans for the Washington, DC area over the past thirty years. Each of these plans contains an outer beltway, he pointed out, yet one has never been built. He hypothesized that the beltway was not built because of the lack of continuity between the administrations of elected officials. To combat this problem, he suggested that planners should take more initiative in educating elected officials, and in providing for continuity and transition when administrations change.

*Mary Joan Pugh* ('76), Deputy Director of the North Carolina Zoological Park, stated that many planners do not perceive of themselves as leaders. Planners often consider themselves to be advisors because of their technical skills, and may shy away from an involvement in politics for job-security reasons. Despite these perceptions, planners are well suited to be leaders, because they have the technical knowledge needed to look at problems and offer solutions, and they have the vision necessary to see where to go and how to get there. The importance of involving people and getting their support for a plan cannot be underestimated. A plan may be technically correct, but without support, implementation is impossible. Planners should take responsibility for getting plans implemented.

*Lanier Fonvielle* ('82), former Durham City Council member, explained that successful leaders need to have clearly defined priorities that guide their work. Planners have the skills necessary to lead, but are constrained by: (1) Ambivalence. Planners often do not know if they should assume a leadership role or leave it to the politicians and planning director. (2) Politicians. Elected officials' desire to please everyone makes setting priorities difficult. (3) The "Great Man" Theory. A planner does not have to be a "great man" to have an impact; planners can have a tremendous effect by maintaining contacts with leaders. It is also possible to gain leadership strength by collecting a group of people who trust in you. (4) Pain of Losing. Consider leadership, rather than winning, as success. To be successful, planners must take risks.

*Jeffrey Swain* ('68), Commissioner of the Department of Community Development in Rochester, New York, closed this discussion by stating that the characteristics of leaders are also those of planners. Planners who serve as leaders must focus on the following:

- *Long-Term Goals.* Leaders often look two to four years into the future.
- *Priorities.* These are difficult first to set and then to keep over the long term.
- *Results.* Leaders must concern themselves with implementation.
- *Reconciliation.* Leaders must solicit input from many groups, synthesize this input, then broker deals between the groups. This is often a real challenge for planners.

*Expanding the Leadership Role for Planners*

*Dwight Merriam* ('73), attorney with the firm Robinson & Cole in Hartford, Connecticut, and AICP Commission President, began this discussion by defining three styles of leaders: (1) the Manager: skilled at organization; (2) the

Charismatic: sets standards, takes pride in work, devoted to welfare of subordinates--often associated with the military; (3) the Visionary or Missionary: moves society along to a better world, caretaker of a future and a world not yet realized. Planners fit best within this third group.

In the profession, planners can become leaders in three ways: (1) by reason of the force of their ideas and long service to the profession; (2) by gaining respect of peers through exceptional commitment and hard work; (3) by making feelings known through volunteerism, speaking out, writing, and going after issues. To be leaders, planners must be wolves in sheep's clothing.

*Laura Bachle* ('86), of the Fairfax County, Virginia Department of Comprehensive Planning, discussed the frustrations of trying to move into a leadership role within an organization. There are often unspoken policies which discourage planners from taking on leadership roles. Management skills are essential for a leader, she stressed. The APA and AICP can also serve an important role in nurturing planners as they strive to become leaders and in renewing the skills of planners already in leadership positions.

*Antoinette Tupponce* ('76), Transit Planner with the city of Winston-Salem, expressed the opinion that planners must accept their role as leaders in communities. Planners must be change-oriented risk-takers who counter those striving to maintain the status quo. Moreover, planners must recognize that they have an active role in setting the agenda, and must create ways to be at the table when decisions are made. This can be accomplished, for instance, by educating the public. When citizens become participants, they will be the implementers and the caretakers, she stated. Planners may leave an area, but citizens will stay and move the process forward.

## Planning Careers and Job Strategies

As part of the 1989 annual conference, the Alumni Association sponsored a discussion on preparing for planning careers and job hunting strategies.

The panel included: *Nancy Randall* ('84), New Jersey Department of Community Affairs Housing Demonstration Program; *Dennis Daye* ('58), Wilbur Smith Associates, Columbia, S.C.; *Chris Anderson* ('88), Wake County Planning Department; *Paul Kron* ('89), Wake County Planning Department; *Mary Bewig* ('87), Assistant to County Manager, Chatham County; *Linda Convissor* ('81), Heartland Real Estate, Durham; and *George Chapman* ('63), Planning Director, Raleigh.

Following the panel discussion, students were able to meet the alumni and ask questions at a reception at the Center for Urban and Regional Studies. A mix of forty-five alumni, faculty, and students attended.

Panelists stressed that graduate school is an opportunity not only for learning facts, but also for practicing and refining skills for professional life. In particular, panelists stressed the importance of leadership, presentation, and written communication skills. Students must learn to take risks in school in order to develop their full potential. Panelists also offered students tips on hunting for jobs. Finally, alumni urged students to take the AICP exam as soon as possible after graduation.

In summary, their recommendations were:

*In School*

- Treat school as a dress rehearsal for professional life.
- Seize opportunities to develop leadership skills and get involved in local planning issues.
- Learn to express yourself in a single page, or better, a single paragraph. Make your technical writing highly readable.
- Develop oral presentation skills. Vary your style to be effective with either technical or public audiences.
- Practice presentation situations involving graphics. Never turn down an opportunity for practice.

*Job Hunting*

- On a resume, sell yourself, but never inflate the truth. You are unlikely to get hired if you look better on paper than you do in the interview.
- When searching for a position, keep up with who is being promoted. When one person moves up, a vacancy occurs somewhere down the line.
- Search for a job that you can develop into the job you want; the job you are looking for probably does not exist.
- Let alumni know you are looking for work. Also, stay in touch with classmates following graduation; they can provide valuable job contacts later.
- Make contact with the person who has the power to hire you, but also complete an application with the personnel office, so you will be eligible to be hired.

*On the Job*

- In small departments you may handle many different jobs, some exciting, some not. In large departments your role may be more closely defined.
- Communicate with your co-workers as well as your boss. No one likes to be misinformed.
- Keep friends and try to get along with everyone. You never know when someone will show up again in your professional life.

# Faculty Research

## Joint Projects

**Edward Bergman** and **Gunther Maier** (Vienna University of Economics Faculty Associate) are continuing their work with the Potential-Simulation model. This model was developed first for Governor Clinton of Arkansas to simulate the economic effects of policies designed to improve highways, entrepreneurial activity, and high school and college graduation rates. They are extending the model to examine evidence of spread and backwash effects prior to submitting a National Science Foundation proposal. Bergman is also focusing research attention on the effects of interdependent development in the delta region for a meeting of the National Rural Studies Committee in Mississippi.

**Edward Bergman** and **Harvey Goldstein** recently completed a study of industrial restructuring in Durham City and County. The authors trace the area's post-World War II spatial development, and then examine the industrial alterations which have taken place since the late 1970s. They document the remarkable changes that rippled throughout the local economy, the workforce, and the broader policy environment of the Research Triangle region. This paper was one of many written for a comparative European-U.S. research project on urban development in the twentieth century.

**Edward Kaiser, David Brower, Raymond Burby, David Godschalk, Harvey Goldstein, Gerard McMahon** and **Steven Walsh** (Geography Department) are undertaking an impact assessment and land use compatibility study for the nine-county region surrounding Fort Bragg in North Carolina. The study will identify current and potential impacts of the Fort Bragg/Pope Air Force Base/Camp Mackall complex on the adjacent land and land uses, on the economy of the region, and on the fiscal base of the counties in the region. The study will recommend land use and other policies for reducing incompatibilities and other negative impacts while enhancing positive impacts. In the course of the project, the research team will use satellite data, computerized cadastral systems, and orthophoto interpretation in developing a hybrid land use classification process. A geographic information system will be used to integrate data on land use, military activity impacts, environment, population and economic activity. The system will be used to model future land use compatibility scenarios as well.

**David Godschalk** and **Mike Miles** (Business School) are developing a prototype geographic information system (GIS) for use in analyzing development opportunities in a regional subarea. Under a grant from the Homer Hoyt Institute, the project will build a database and models based on the Umstead Planning District of Raleigh, an urbanizing corridor running northwest of the city toward the Research Triangle Park. The GIS component uses ARC/INFO software, and includes data on property ownership, population and economic characteristics, infrastructure, and land use. The project is aimed at developing a user-friendly GIS capable of bringing together planning and real estate information and development scenarios.

**David Brower, David Godschalk,** and **Michael Luger** are evaluating the national Coastal Zone Management Program under a grant from the National Coastal Resource Research and Development Institute. Their study is designed to address the concerns of Congress in connection with re-authorization hearings in 1990 for the Coastal Zone Management Act. The study will assess the program's effectiveness in meeting its goals of environmental protection and economic development, and will examine the first comprehensive national evaluation of coastal resources and coastal management efforts.

## Individual Projects

**Edward Bergman** recently completed Industrial Transition Paths, a research project conducted for the U.S. Economic Development Administration (EDA). Work begun on that project was extended in a separate study of industrial restructuring in metropolitan regions, their county components and peripheral rings. Major findings indicated that industries dependent upon labor, capital, or resources were expanding in peripheral rings of the largest U.S. Metropolitan Statistical Areas (MSA), while technology-dependent industries favored small MSAs and the core areas of the largest metropolitan centers. Another extension of the EDA project evaluated the contribution of various factors to growth of two kinds of high-tech industry: industries with high research and development expenditures versus industries with concentrations of scientists, engineers, and other highly trained professionals. Focusing on more local issues, Bergman also studied the metropolitanization of North Carolina's economy for the North Carolina Commission on Jobs and Employment. The policy issues and political constraints of a traditional development model were contrasted with the spatial patterns of population settlement, labor force concentrations and economic production.

**Ellen Wratten** is evaluating the impact of the World Bank's self-help housing projects on low-income families in Kenya. During the last two decades, the World Bank has encouraged Third World countries to abandon conventional housing policies in favor of self-help site and service schemes and settlement upgrading projects. These projects transfer responsibility for house construction from the government to individual consumers, and minimize public subsidies to the poor.

Wratten's research seeks to determine who has benefitted from the self-help approach, in what ways they have benefitted, and why. It relates three stages in the housing allocation process. First, the study analyzes the World Bank's objectives and expectations about the impact of its shelter strategy. Second, the study estimates the degree to which the plot allocation criteria are modified by local implementation agencies. Third, it assesses the extent to which the original allocation pattern is changed over time by market incentives to sell and sublet property to people outside the target income groups. Household surveys have been conducted among plot owners and tenants in two sites and service schemes in Nairobi and an upgraded squatter settlement in Mombasa. The research is sponsored by grants from the United Kingdom Economic and Social Research Council, the Smuts Memorial Fund, the Bartle Frere Fund, and Wolfson College, University of Cambridge, England.

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# Student Research

## Dissertations

*Some States Take the Lead: Explaining the Formation of Effective State Technology Policies*
**Robert D. Atkinson**

In the face of recent economic restructuring in many regions of the nation, states have emerged as significant actors involved in formulating economic development policy responses. In particular, states have increasingly promoted technological innovation in an effort to stimulate employment and regional economic growth. These efforts are distinguished from more traditional economic development policies in that they attempt to target innovation in its various phases. Methods used include: support to higher education and research institutes, specialized labor training, promotion of high technology complexes, and encouragement of the diffusion of ideas.

However, while innovation policy is an appropriate response to economic restructuring, especially in areas with technology-based manufacturing economies, not all states have made significant efforts in this area. Working within a general theoretical framework of government economic policy making, this dissertation explains the relationships between the variables that characterize the process of innovation policy making at the state level and the production of rational or irrational policy objectives. The analysis determines the factors which enabled and/or prevented states from developing strong and well-designed policy efforts.

Six states were examined using a holistic, case study methodology. Primary data was obtained from documents and interviews with key public and private policy makers. In-depth interviews were conducted with business, government, labor, and university officials to determine the policy making process and the extent of policy rationality in their state. Secondary data from written accounts of policies and the policy process was also used.

Several important factors were found to contribute to state policy rationality. These include: increased activity by labor, business, and universities in support of a state technology policy effort; corporatist, rather than pluralist forms of interest intermediation; an administratively, rather than legislatively, initiated effort; a reduced role of the state budget office; a strong commitment to economic development by the governor and key "policy entrepreneurs"; reduced levels of industrial recruitment; and a strong, analytically guided planning effort on the part of the state. Finally, state political cultures conducive to non-partisan policy making and an activist state government role facilitated the development of effective technology policies.

*The Role of Print Media in Influencing Public Opinion in Development Conflict Issues*
**Harold Hubbard**

When development issues arise in which there is community conflict, there are many influences which shape public opinion. Studies have been conducted on the effect that friends, family, and community leaders have on the formation of public opinion. However, there are still many questions in the communications and planning fields concerning the extent to which the media influences citizens' attitudes on public affairs. Public opinion formation is an important topic to the planning profession because opinions are the prime force that influences the decision-making process in planning related issues.

Because of the local nature of development conflicts and the dominance of local issues in print media, the "press" will be the focus of the media investigation in this study. When a development conflict arises, there is often sufficient community opposition to a proposed development to make this controversy a regular issue in the press. It usually becomes a "touchy subject," discussed or acted upon before a body of elected officials. The objective of this research effort is to develop an understanding of the role that print media plays in influencing public opinion in these types of community conflicts.

*Rural Development and Internal Migration in Bangladesh*
**James H. Fisher**

This research focuses on the population implications of rural development programs. In particular, the question of whether rural development slows or accelerates migration out of villages is examined.

Conceptually, development programs are divided into those which are person-oriented and those which are place-oriented. Person-oriented programs act primarily

through human capital building, while place-oriented programs take the form of fixed capital construction or improvements. Migration is defined as any inter-household mobility which occurs over periods greater than one month. The hypotheses form an analytic model which associates development programs with participation. This in turn influences separable processes of person and place development.

Field work was conducted in Bangladesh from November, 1984 to May, 1986. Sponsorship for the research was provided by the United States Fulbright Scholarship Program. Residential histories for 140 males and 140 females were collected through intensive interviews in four villages in Bangladesh. The respondents constitute a random sample of the adult population of the villages. Subsidiary data on communities and subdistricts were also collected.

The findings indicate that individual development programs have had a greater impact on the lives of the poorest population groups. It was expected that adding to human capital would encourage migration to urban areas; however, these person-oriented programs have not provided sufficient skills development, such as literacy training, to encourage migration of adults. A greater impact is likely to ensue on the part of younger participants. Small scale place-oriented programs, in general, are found to act to retain population through increased employment opportunities.

*Location Theory: The Location of Squatter Settlements in the Urban Areas of Developing Countries*
**Aly Karam**

One of the noticeable consequences of urbanization in developing countries is the growth of squatter settlements in urban areas. Squatter settlements are problematic for the following reasons. First, they are illegal settlements which threaten private and public property rights. Second, they do not pay property taxes, and therefore, do not contribute to the municipality's revenues. Third, squatter settlements pose health and fire hazards because they are densely built of flammable material and lack both sewer systems and potable water.

Squatters locate in central or peripheral areas of the urban setting. The proposed study is designed to develop a more comprehensive model for determining squatter settlement location. It will be a basis for understanding the dynamics of the squatter settlement within the urban area and the iterations that take place between the squatter settlements and the urban setting. This model will enhance our ability to relocate squatters to serviced locations in cases where it is not feasible to service the existing settlements. Not only will this lead to successful relocation projects, but it will also improve life for the squatters.

*Equity Based Model of Commercial Mortgage Default*
**Robert A. Simons**

This dissertation examines the determinants of mortgage default among non-residential properties and seeks to evaluate the role of borrower equity and, to a lesser degree, borrower income in the default decision.

The research draws upon microeconomic theory which indicates that the default decision is a rational, wealth-maximizing one. The mortgage instrument is recognized to contain an implicit put option which permits the borrower to return the property to the bank if the net equity in the property is negative. The other primary determinant of default is theorized to be a deficiency in borrower income which may be attributed either to excessive costs or weak cash flow.

A quasi-experimental research design will be employed, using twenty defaulted loans paired with a similar number of non-defaulted loans. Statistical tests are planned to determine if either of the above hypotheses can help explain the default decision. A pooled time series cross-sectional design will be employed.

The loans used in the research are from state lending agencies in the northeastern United States. The agency data will be supplemented by secondary information from local assessor's offices, appraisals, and financial market information.

Policy implications of the research involve the utilization of financial subsidies in public lending programs and the more effective use of public funds to meet stated policy objectives and assist in deterring loan default.

## Departmental Papers

*Home Ownership Assistance for Low Income Persons: Is This the Dream for Everyone?*
**Teri Beckman**

Chapel Hill, North Carolina is completing the last phases of the Tandler Homeownership Program, the town's first publicly assisted home ownership project. This program assists low and moderate income people in purchasing a new home with a subsidy from Chapel Hill. This paper evaluates the program and makes recommendations for future home ownership programs. Town staff, members of the private development team, lenders, homeowners, and people who investigated the program were interviewed. One of the questions addressed in this paper is whether the program design met the stated goals of the project. Further, this paper analyzes the home buyers, the marketing effort, the lender's experience, and builder's experience with the program. The evaluation of the Tandler program was requested by the town and completed under the supervision of Professors Michael Luger and Michael Stegman.

*Negotiating the Review and Approval Process for Master-Planned Communities: A Case Study of Treyburn, A Project in Durham County, North Carolina*
**Irving Boykins**

Project review and approval have become critical aspects of the development process. They can no longer be taken for granted. This is particularly true for large-scale, mixed-use projects which require multiple year build-outs. There has been a proliferation of such projects over the last decade. In fact, they have become the dominant form of suburban and exurban development.

In negotiating approvals for these projects, developers face a dilemma: how to vest their rights, while simultaneously ensuring flexibility to adapt to changing market conditions over the course of the build-out. Local officials, on the other hand, must negotiate this arrangement without unreasonably binding future legislatures. This paper examines how the master developer of Treyburn, a fifty-two-thousand-acre planned community in Durham County, North Carolina, resolved this dilemma.

*A Project Evaluation of the Durham County Habitat for Humanity*
**Jonathan Soulen**

This paper evaluates the Durham County Habitat For Humanity. Founded by Millard Fuller in the mid-1970s, Habitat For Humanity seeks to eliminate substandard housing in America. The organization's membership has increased over the past few years due to successful projects, as well as the participation of former President Jimmy Carter.

The affiliate in Durham, North Carolina has been in operation since 1985. Since that time, it has built seven houses; six more are on the way. By using volunteer labor and donations from individuals and corporations, the Durham affiliate is able to sell two and three bedroom houses for around $31,000.

Using several books that describe evaluation techniques for neighborhood development organizations, Soulen creates an evaluation framework for the Durham Habitat. Interviews with board members, local planning officials, community leaders, and volunteers provide the base of information.

The factors that seem to be important in the success of the Durham affiliate include a full-time work supervisor, support and direction from the national Habitat headquarters in Georgia; and the ability to attract and manage both money and volunteers. The attributes that influence the affiliate change from month to month, as do the issues that challenge this neighborhood development organization.

*Measuring Development Potential*
**Tim West**

In order to develop policies which will improve a region's competitive position, it is essential to first understand the basic factors which drive the region's development. This paper examines such regional development fundamentals, as well as development potential in the Tennesee Valley labor market areas.

Based on a framework of concepts developed by Professor Emil Malizia, this study shows that productivity and innovation potential are two of the most relevant factors influencing a region's development. These two fundamental development requirements are measured by educational and occupational attainment levels. To investigate these factors, the study focuses on five labor market areas. A major conclusion is that rural and urban contributions to development vary across labor market areas. A similar research design could be used to assess the development potential of any given area.

*A Case Study of the Management and Disposition of City-Owned Property in New York City*
**C. Duncan Yetman, Jr.**

Much of the vacant land and abandoned housing in distressed areas of our nation's cities is now in municipal ownership. Cities have taken these properties for the non-payment of real estate taxes. What are the institutional forms through which cities manage and dispose of these properties? How do these arrangements affect the availability of land for redevelopment and the pattern of land use? How do these emerging patterns of land use affect the economy, efficiency, and equity of a city?

This paper addresses these questions by providing an in-depth look into how New York City, plagued by tax delinquency and neighborhood disinvestment, has handled the management and disposition of vacant, city-owned property. The paper outlines the disposition process in New York in a detailed, step-by-step fashion and covers the five means of disposing the properties: unrestricted auction, restricted auction, request for proposal, negotiated disposition with a single party, and assignment to another city agency.

The last part of the paper examines some controversial dispositions in the City, evaluates the current disposition policy and process, and offers some recommendations. The recommendations focus on changing the basic objective of city government from facilitating private ownership of these parcels to maximizing the efficiency of public ownership.

## Projects

***Eastern North Carolina Buyer/Supplier Linkage Project (Funded by the North Carolina Rural Economic Development Center)***
**Jay Szklut and Barbara Modelski**

This project explores methods to strengthen and expand small and medium-sized businesses in eastern North Carolina by building upon markets provided by major industries in the region. Because of time constraints and traditional methods of purchasing, many firms are not aware of opportunities for purchasing products and services locally. As a result, buyers suffer reduced flexibility and control over the quality of the products they need while paying a premium for transportation and storage. Local firms often produce these items at a better price while providing better service. Moreover, local businesses often miss lucrative opportunities because they are too young or too small to hire marketing staff. Based on a strategy called "import replacement," this project examines the potential for connecting businesses with local suppliers of the goods and services they purchase. This innovative economic development strategy gives existing businesses an opportunity to take advantage of market opportunities, thereby creating or preserving local jobs and stimulating economic diversity.

Specific aims of the project include: (1) identification of the characteristics (annual sales, ownership, and type and diversity of product line) of participating buyer firms; (2) identification of potential markets provided by major buyers for locally produced goods; (3) identification and ranking of the relative importance of buyers' purchasing criteria (product quality and cost, technical support; supplier responsiveness); (4) identification of purchasing patterns (distance from suppliers, characteristics of supplier firms, relationship with suppliers) of buyer firms; (5) identification of the characteristics (annual sales, ownership, competitive advantage, and factors limiting expansion of sales) of potential supplier firms; (6) identification of sales and purchasing patterns of supplier firms (marketing area, type and diversity of product line, degree of dependence on major customer); (7) identification of the characteristics of operations/production (management philosophy, technology, flexibility, capacity, "human capital" requirements); and (8) recommendations for public and/or private programs to enhance the possibility of local buyer/supplier linkages.

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# Commentary

*With so much attention focused on planning for the "new South," the sense of a historical perspective is often lost.* Carolina Planning *is grateful to two of our readers for bringing the following article by Lewis Mumford to our attention, suggesting that after forty years it "may still be worth reading." Mumford, best known for his pioneering works such as* The Culture of Cities (1938), *wrote "A Thought for the Growing South" in 1949 after spending a year teaching in North Carolina universities. The article was commissioned by George Myers Stephens, publisher of* The Southern Packet *(who was also the father of two graduates of the Department of City and Regional Planning at UNC-Chapel Hill).*

*We reprint the article here with great pleasure, along with commentary by DCRP professor David R. Godschalk, who explores the relevance of Mumford's thoughts to the state of the "growing South" of today. We hope that renewed examination of this piece will be thought-provoking to current planning students and practitioners, now in a position to guide the course of development in our region.*

Carolina Planning *welcomes suggestions of noteworthy articles by "planning legends" for future republication.* -- Eds.

## Comment by David R. Godschalk

Forty years ago, the great regional planning advocate, Lewis Mumford, advised North Carolina and the South on how to manage future growth. From his vantage point as a visiting lecturer at the UNC-Chapel Hill Department of City and Regional Planning, the North Carolina State University School of Design, and Women's College at Greensboro, he advocated an urban design strategy based on decentralizing cities and keeping them small, uncongested and in contact with nature. It is interesting to note how his advice, published as "A Thought for the Growing South" in The Southern Packet, has been heeded.

Fearing that the University of North Carolina might become "another metropolitan study-factory, with fifteen or twenty thousand students," Mumford urged that a multi-campus state university system be developed to accomodate the growth in student population. Although the Chapel Hill campus now has over twenty thousand students, the state has followed Mumford's "planned decentralization" notion by creating a sixteen campus system which avoids the giantism of a University of Michigan, with its student population of some fifty thousand. And while the UNC-CH campus has not escaped congestion and the loss of open spaces, it has managed to preserve many of its beautiful older buildings and quadrangles.

Mumford also urged that garden cities be built, based on the "organic limitations" of growth. Each would be a balanced, self-contained community of limited size, surrounded by a permanent belt of rural land. When the city reached its population limit, another new town would be started with the same balanced, self-contained pattern. Although their ultimate growth will be larger than the ideal population of thirty thousand postulated by Mumford, the towns of Chapel Hill and Carrboro, together with Orange County, have in fact surrounded themselves with a low-density rural buffer which defines the edge of future urban development. It will be interesting to observe whether future leaders are able to hold this line.

The Research Triangle region also is seeking ways to follow Mumford's principle of an uncongested balance between industry and agriculture, trying to preserve the neighborliness and informality of the South while pursuing a high-tech future. Whether the region can pull this off is still open to question. Mumford would be proud of our efforts to build the largely green Research Triangle Park employment center, create a regional open space network, protect our water supply watersheds, and intelligently guide our region's growth. He would certainly urge us to do even more to create a regional transit system and to curb the overzealous development which threatens to blend our individual cities into a single sheet of urban area. The 1988 World Class Region conference was one effort to respond to Mumford's challenge to provide the "social vision and the civic courage" to match our great natural resources.

In short, Mumford emerges as a wise counselor, a prophet with honor. His advice is still fresh today. I wonder how much of the advice of today's urbanists will be able to withstand a similar assessment forty years from now.

*The following article was reproduced with permission from* The Southern Packet, *Vol.V, no.4 (April, 1949).*

The Southern PACKET

A Monthly Review of Southern Books and Ideas

Volume V APRIL 1949 Number 4

# A Thought *for a Growing South*

*By* LEWIS MUMFORD

LEWIS MUMFORD, *writer and professor of the Humanities, has been working with southern students this year in the fields of architecture, city and regional planning, and art. As visiting lecturer at the North Carolina State College School of Design, at the Department of City and Regional Planning at Chapel Hill and at Woman's College of the State University at Greensboro he has had opportunity to add to his general knowledge of the South through observation of community growth in North Carolina.*

*Though he uses this state as his example, he points out that most of the South can benefit from similar conditions in planning for the future.*

*His current writings appear in the* Saturday Review of Literature *and the* New Yorker. *His interest in higher education brought him membership on the Commission on Teacher Education of The American Council on Education.*

THE people of North Carolina are justly proud of their many natural resources, spread out in great diversity, from seashore to upland. But one of their most important assets they seem to have overlooked: their present pattern of population distribution.

Almost alone among the industrial areas of the nation, North Carolina is still a state in which most of its population is either rural or living in cities of less than a hundred thousand. In other words, industry and agriculture are still in balance here. Whether North Carolina will maintain this balance does not depend upon uncontrollable forces of nature: it depends upon whether people understand the advantages of such a population pattern and whether the state uses its powers to maintain it.

(What applies to North Carolina applies likewise, of course, to a great part

of the South. I have used North Carolina as an example because it is that part of the south with which I have had the greatest first-hand contact (In this article the terms "South" and "North Carolina" are mostly interchangeable).

Thanks to Dr. Howard Odum and his fellow workers, Chapel Hill and the University are the home of modern regionalism in America. But if North Carolina continues for very long to follow the path of least resistance, as it is now doing, it will commit the same mistakes that have been made in most other parts of the country. In that case the cities of North Carolina will lose their regional characteristics, instead of developing them further, and will take on the worst features of metropolitan areas everywhere, with blight and bankruptcy as their final portion. In fifty years, if North Carolina does not plan to maintain its present decentralized pattern, Charlotte, Raleigh, and High Point will be indistinguishable from Detroit; and the surrounding countryside will become merely a real estate speculators' annex to the growing metropolis.

Following the same pattern of uncontrolled growth and expansion, Chapel Hill will be another metropolitan study factory, with fifteen or twenty thousand students; its campus overcrowded, its old buildings either destroyed or reduced to insignificance, its whole educational procedure over-organized, over-routinized, over-institutionalized by the mere fact of congestion.

Under such conditions, the South will be wealthier in all the things that money can buy and poorer in all the things that are beyond price or purchase: neighborly association, friendly intercourse, home life, intimate contact with nature, the spiritual values that cannot be mechanized, standardized, or wholly institutionalized. You can already read what will happen in the future to the state at large if you look at the editorial pages of your newspapers: they are filled with syndicated features: mouldy crumbs of gossip dropping from the dinner tables of New York and Washington.

With North Carolina's steady industrialization, the forces that are now at work will produce congested cities and a sickly, bleached out kind of life, imitating the fashionable patterns of New York and Chicago, but incapable of producing anything in its own right worthy of being exported from the region and universalized. Yet the problem of transforming the current pattern of industrialization is not beyond the ability of man to solve. Most of the measures that must be taken in the South may be of a positive rather than a remedial nature: they are matters of preserving a balance that still exists, rather than of re-establishing a balance that has been almost utterly destroyed. If you value the life of the small town, with its emphasis on family, with its nearness to the open country, with its social life centered primarily in the school and the church, with factory workers who will tend their gardens and neighboring farm workers who are still available for jobs in factories--if you value these things, you can now take steps to preserve them. And if you look forward to a continued development which will bring North Carolina the best that the world now offers by way of music, painting, sculpture, drama, enabling it to be a creator instead of a mere consumer of the arts, you can bring all this about without accepting also the over-crowding, the waste and fatigue of unnecessary travel, which are the penalties for metropolitan development.

But do not mistake the problem. Your existing small towns, with occasional happy exceptions, are not ideal, either in outline or content; your bigger cities too, need a good deal of doing over in order to make them serve public needs--for open spaces, greenbelts, playgrounds, school and community centers--that were not recognized even half a century ago. If you face these deficiencies now and frame a public policy of guided urban growth for each state as a whole, the cities of the South may show as many advances as the Tennessee Valley does in power development and flood control. For the decentralization of cities *is* flood control--the flood control of population.

But the time for a decision is now at hand. During the next generation, possibly during the next decade, the citizens of North Carolina will make commitments that will profoundly affect the future of their land and their people. And if they fail to grasp the problem and let the current notions of "profit, prestige and power" continue to dominate, then their inaction will in itself constitute a decision, and by that fact they will have battered their fine birthright for a mess of metropolitan pottage. But the advantage of the present distribution of population, which is the result of historic accidents, entirely unplanned, cannot be maintained without bold intervention and positive action on the part of the state, in cooperation with the leaders of finance, industry and business. To make this decision intelligently, you must understand the lesson first taught half a century ago by Ebenezer Howard: the lesson of guided growth. Though he applied that lesson first of all to the growth of cities, it applies equally to any other kind of human organization, to a factory, an office, a hospital or a college.

Howard observed that the over-growth of cities was not the blind result of natural forces; it was due to the purposes and intentions of men, seeking a cheaper source of labor, high land values, a large market to dispose of their goods, and many other factors. But in the course of promoting such growth in the nineteenth century the most successful cities over-reached themselves; they grew so big that they cut themselves off from the real sources of life and became disorderly, lopsided environments, with insufficient parks, playgrounds and private gardens, with expensive and time-wasting transportation systems that took people daily from congested homes where they had rather not live to equally dismal factories and offices where they had rather not work. The bigger such cities grew, the more money they were compelled to spend on remedies for their own over-expan-

sion and congestion, and the less they had available for health, recreation, education and culture. Originally the open country, through the presence of nature and the maintenance of traditional ways of life, had many precious elements the big city lacked; but the city took away ever growing numbers of people from the country. Those who remained suffered ofter from remoteness and loneliness, from impoverishment and the lack of social contacts.

Howard concluded that neither the overcrowded city nor the depopulated countryside were satisfactory human environments. He proposed to remarry the town and country by creating a new type of community, which he called a garden city, to combine the advantages of both and evade their penalties and defects. Howard believed that almost all the advantages for daily living in cities could be achieved in a balanced self-contained community of some thirty thousand people, surrounded by a permanent belt of rural land, capable of holding another two thousand. The emphasis in this notion falls on the words "balanced" and "self-contained." By a balanced community, Howard meant not a suburb or a fractional part of a city, however generous its open spaces, but a complete urban community in which the work places would be within walking distance of the homes. To be self-contained, such a community must be limited in area, in population and in density. When the time came to accommodate more people, as a result of the natural growth of population or the expansion of industry, one must not keep on adding automatically to the facilities of the old centers: one must create new centers, also in balance, with an eventual duplication of the facilities for business, industry, education and social life generally. Balanced development and guided growth must go hand in hand. With more of such cities in existence the countryside would profit too: more local consumers for fruit, vegetables, wood, services and a wider range of seasonal industrial jobs.

This is not the place to describe the extraordinary influence of Howard's idea on town planners all over the world, nor his final triumph, after founding two experimental towns in England, in the British New Towns Bill of 1946, which provided for the building of a series of new towns, limited to sixty thousand population, as a means of opening up the overpopulated districts of London and controlling future growth.

What is even more important, Howard called attention to a factor completely overlooked in the general expansion of industrial and municipal facilities in the nineteenth century: the organic limitations of growth. With all living organisms there is a definite form of growth; below that limit we produce dwarfs, above that limit giants, both penalized by this failure to keep to the norm. Now cities are not organisms but human organizations; yet they share in some degree this special limitation. Historically, the over-expansion of cities is associated with the disruption and disintegration of civilizations. The old American notion, "the bigger the better", has no foundation in fact.

If the notion of controlled and limited urban growth were accepted in the South, if the advantages of the small city were fully realized, the appropriate political and economic agencies for promoting this kind of growth could be devised: agencies which would partly assist in the re-planning of the existing centers, partly in the development of new centers of limited population and balanced facilities, partly in the unification of groups of related cities that would have the benefits of centralized effort for common purposes without the penalties of congestion. It would be premature to outline such policies and programs, though it is important to understand their feasibility. At this time it is wiser to stress how the principle of controlled growth would apply to other institutions as well. Let us take, for example the University of North Carolina at Chapel Hill.

The campus of the State University at Chapel Hill is one of the most beautiful in the whole country. During the last fifteen years an enormous growth has taken place there: more students, I have been told, were graduated since 1935 than during the whole of the institution's previous existence. Scarcely a patch of land on the campus has not been built over or has not been assigned to a structure soon to be built. It has reached its natural limits of development with its present student population; and in certain buildings, like the library [Wilson Library -- EDS.], inept planning and design have produced a structure entirely out of scale with the rest of the campus. At this point comes a choice. If the university continues its automatic expansion at Chapel Hill, all that now makes the campus so admirable will, in the course of the next thirty years, be over-built and destroyed--destroyed by people who piously respect the past, but have not yet learned the only terms on which its traditional virtues may be preserved.

But another path of development is possible: not continued agglomeration but planned decentralization. To preserve Chapel Hill there is no need to limit the number of students given a higher education by the state. What is needed is to follow Ebenezer Howard's principle, the principle followed by nature in the overcrowded bee-hive: and that is to hive off and start a new part of the University, indeed a series of new parts, each destined in the end to become as big as Chapel Hill now is. In other words, instead of trying to double the present student population at Chapel Hill, two centers instead of one should be built; instead of tripling it, three centers instead of one--and so on. One of these new centers might be placed in the Asheville area, another in the Winston-Salem area, perhaps a third in the Charlotte area. The precedent for this already exists: for the University of North Carolina is not one institution but three, and Raleigh and Greensboro--not to mention the state teachers' colleges--share part of the population that might otherwise unwisely have been concentrated at Chapel Hill. By taking care of its natural growth in this fashion,

North Carolina would not merely conserve one of its most valuable treasures, Chapel Hill itself, but add considerably to the educational and cultural advantages of other parts of the state. Particularly in adult education, the teachers in decentralized institutions, no longer obliged to travel long distances from Chapel Hill, would have a much closer relation to the people they serve.

In short, with city buildings and in institutional development, congestion brings the penalty of disorganization, inefficiency and lapse of function. By the same token, organization and economy demand a deliberate policy of decentralization. The old-fashioned method of funneling people into centers that become ever more congested and ever more expensive to run and ever more unsatisfactory in their human and social relationships, need not be copied by the State of North Carolina. All its industries, textiles, ceramics, furniture, cigarettes, may greatly increase and many new industries be added, without breaking up its present population pattern--provided its leaders understand how valuable that pattern is and how much the whole community has to gain by maintaining and perfecting it.

The new method of growth is to set a limit to automatic growth and to take care of fresh growth by building new centers, also limited in size and area and density. If the new method is chosen, all that is good in the traditional agricultural folkways can be maintained in the neighborhood units of the new centers.

Yes, and much more can be added, provided the citizens of the state have the social vision and the civic courage to match their great natural resources. To accomplish all these valuable social results under the democratic process will, plainly, require political skill of a high order, coupled with an ant-like patience and persistence in getting around obstacles. But if I can judge at all from the southern students I have been teaching this year, these qualities are already at hand, waiting for the leadership that will give them such a worthy goal.

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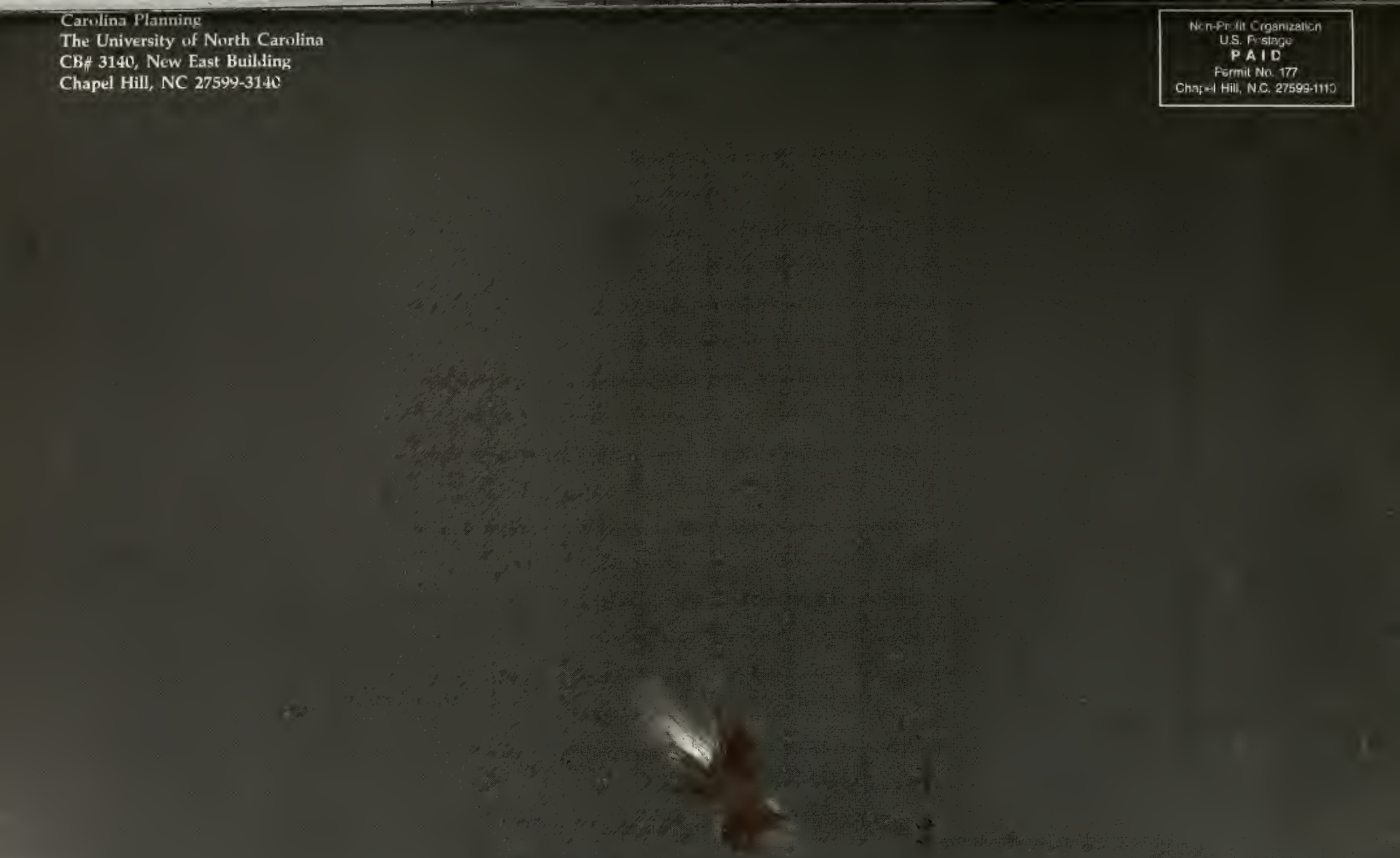

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